

AUTOMOTIVE INDUSTRIES

The AUTOMOBILE

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Number 13

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NEW YORK, SEPTEMBER 23, 1920

Thirty-five cents a copy
Three dollars a year



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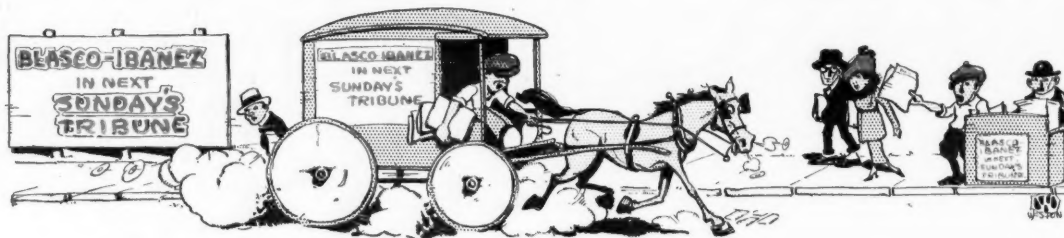
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VOL. XLIII

NEW YORK—THURSDAY, SEPTEMBER 23, 1920

No. 13

Optimism Rules M. & A. M. A. Credit Meeting

Encouraged by assurance of Governor Harding of Federal Reserve Board that automotive products are in good financial standing, parts men denounce rumor circulators and look forward to good business when transportation difficulties are ended.

By James C. Dalton*

CLEVELAND, Sept. 18.

CALM confidence in the future of the automotive industry is replacing the spirit of pessimism which has pervaded the parts and accessory manufacturers for the past six weeks. Financial difficulties through which several companies found themselves floundering, with the receiverships which resulted, not unnaturally produced an atmosphere of gloom which soon was reflected throughout that branch of the industry, but this largely has been dispelled. The situation has been assessed at its true value and an appraisal made of the inherent soundness of conditions.

Strengthened morale was the outstanding feature of the combination credit and advertising convention of the Motor and Accessory Manufacturers' Association which closed here to-day. It was to be found in the addresses which were made and in the casual conversation of the members present. They have no illusions about the next few months, but they have become convinced that the industry

has approached a rock bottom level of production and sales. The credit men expect more failures and are preparing themselves for financial losses in consequence. There are a score of names on their list of seriously injured, of companies wavering between life and death. But none of the big companies appear on that roster. Some of the veteran corporations of the industry have had more or less narrow escapes, but all of them will pull through unless something entirely unexpected happens.

Credit and patriotism are not closely linked in the popular mind, but there was an abundance of patriotism in the convention. It was not of the flag raising, national anthem singing variety, but was based on old-fashioned Americanism and the realization that the greatest and most prosperous nation in the world will stand like a rock while the waves of readjustment and uncertainty beat about it.

Complete understanding of conditions in the industry has been difficult for the men on the firing line. It has been hard to steer a straight course through the currents, cross-currents and eddies which have beset them for the last six months. They have

*News Editor Class Journal Co.

heard so many rumors of disaster that it has been hard to separate the false from the true. Factory after factory has curtailed production and the parts makers have seen a serious shrinkage on their books. They have not been immune from credit and transportation difficulties and these, coupled with a steady falling off in business, have been alarming.

They now realize, however, that when they strike a balance of the year's business they will find that in most cases it will far exceed pre-war levels. That is true of the entire industry. The tremendous earnings which resulted from the backed-up demand which accumulated while the nation was at war could not continue indefinitely. A survey of the industry undoubtedly would disclose that the volume of business now is greater than it would have been if there had been no war and it had expanded at the normal rate which had been established before the conflagration which shook the world.

Therein also is to be found the reason for a majority of the failures which have been recorded thus far and which may come in the future. These companies rode along on the flood tide of prosperity and when the tide receded, as tides inevitably do, they were left high and dry. These facts clearly understood, that branch of the industry assembled at the convention here has been infused with a new courage and is facing the future resolutely, firm in the faith that the business they are in is too great and too essential ever to be seriously shaken.

Two sessions of the credit convention were highly important from a practical viewpoint. One was the executive meeting at which Sidney S. Meyers, general counsel of the association, reviewed the work of the credit service committee, and there was a frank discussion of the affairs of the companies which are in financial difficulties.

The other was the address of W. P. G. Harding, governor of the Federal Reserve Board, who threw new light upon credit conditions as they are reflected in the automotive industry. Two points he made stood out as beacons for every man engaged in the manufacture and sale of automobiles.

The industries he classed as absolutely essential were food, fuel, clothing and housing, WITH TRANSPORTATION TO KEEP THESE COMMODITIES MOVING. By inference, at least, he told his hearers to go out and shout abroad the messages that automobiles—trucks and passenger cars—are transportation.

He made it so clear there can be no possibility of misunderstanding, that the **Federal Reserve Board has issued no edict against automobile paper.** Indirectly, he rebuked the two or three governors of member banks who have arbitrarily and without official sanction, classed passenger cars as luxuries. **Such action, he declared, is plainly outside the province either of the board or the district banks.**

Incidentally he explained how the false report of adverse Federal Reserve action has been spread from one end of the country to the other. It was due, he said, to the "passing of the buck" by the small town banker and even by some of those in larger cities. Banks want all the business they can get, he pointed out, and they never like to gain the animosity of a patron who once carried a large balance and who may do so again, but who needs credit at this time.

Therefore, when a business man to whom they do not feel justified in granting credit asks for accommodation which they have to refuse, they say to him:

"Bill, I'd like the best in the world to accommodate you, but the Federal Reserve bank won't let us."

This is a most convenient and plausible excuse and it undoubtedly is the one which has been given to many an automobile dealer in need of funds.

In the last analysis, Governor Harding declared emphatically, **the granting of credit in the automotive industry is up to the individual banker and the individual borrower.** Each bank must determine for itself what are and what are not essential loans in its particular district. Mr. Harding pointed out that this undoubtedly would include automobiles in cities like Detroit, Cleveland and Indianapolis, while in Boston it might be salt fish.

If he were a banker, Mr. Harding said, and an automobile dealer whom he knew to be reputable and reliable came to him for credit, he would grant it without question. On the other hand, if he were asked for a loan by a dealer he had reason to believe was doing too big a business on too small a capital, he would scan each piece of paper separately. If the dealer presented the note of a man who had a legitimate need for a car and who could pay for it without undue strain, that note would be discounted. But if the dealer offered the note of a man who could not afford to own a car or who had no real need for one, that note would be refused.

In the speech of Governor Harding the automobile dealer who can justly ask for bank credit has an unanswerable argument for the banker who refuses to grant him a loan on the ground that the Federal Reserve bank won't let him.

Governor Harding began his address with a defense of the Board's course. He showed that instead of engineering a movement for the contraction of credit, it had fostered a development of credit and further had aided in the placing of this credit to the more essential channels of trade. Figures were quoted to prove this. As to the much discussed meeting of the Federal Reserve Board in May last he said:

"We found that not only had there been an abuse of credit for non-essential purposes to meet the extravagances of various kinds, but that commodities representing products of farms of the last year were being held back, partly of necessity on account of lack of railroad facilities, and partly in the hope of getting higher prices, which tied up a vast volume of credit. We were looking forward to the seasonal movement of crops, the crop-moving season to which we have now entered, and some concern was felt as to our position to meet safely and effectively the legitimate demands, which were going to be made on the banking system during the next few weeks, unless we put some restraining influences into action to stop undue use of banking credit.

"After talking the matter over we decided that banks generally should be cautioned to use a more discriminating judgment in granting credits and that they should give preference to loans of an essential character rather than to those of a non-essential character. We felt then, and we feel now, that the advice given was sound, and that the country has been very greatly benefited by the action that was taken. The Federal Reserve Board has distinctly declined to give any definition of essential or non-essential loans. When you think about it, you will realize what an exceedingly difficult thing it would be for any board of seven men sitting in Washington to undertake to define by any rule of countrywide application what is an essential industry and what is a non-essential industry, and what is an essential loan, and what is a non-essential loan. We stated then, and I repeat to-day, that the Federal Reserve Board will not

undertake to give any definition of essential and non-essential loans.

"While the Federal Reserve Bank is in better position to undertake such a definition than the Federal Reserve Board is, still we feel that the Federal Reserve Bank itself will better conduct its business under the provisions of Section 4 of the Federal Reserve Act which requires the directors to administer the affairs of the bank fairly and impartially, and without preference to any bank or group of banks, and in extending its accommodations to make such loans as may be safely and reasonably made to member banks with due regard to the wants and requirements of their member banks. That means that they should not permit any member bank for the purpose of unduly extending its business to receive an undue volume of rediscount accommodation at Federal Reserve Banks, particularly when these extended credits to a few banks might impair the Reserve bank's credit to meet the legitimate demands of other member banks. The matter of granting loans to the individual, or to the firm or corporation, is a matter which is entirely in the hands of member and non-member banks, with which these individuals and corporations deal.

"Now, while we have never undertaken to define essentials, I think it is axiomatic, and all will concede it, that there are four great fundamental essentials, food, fuel, clothing, shelter, and in order to provide these necessities transportation looms up as an absolutely important factor."

The speaker then described how the Federal Reserve Board and Banks had left it to the local banker to decide which were essential loans for his community. He best described the local situation by reviewing how he would act as a local banker. In this connection, he said in part:

"The whole question, therefore, of the essential and non-essential character of a loan is left for individual determination by each member bank.

"Now, I imagine the business in which you are interested experienced a very great expansion in the months that followed the war, and I presume that some of you will admit that people in some cases bought the articles in which you are dealing on credit that had no business using their credit in that direction. I have been a banker, and if I were a banker to-day this would be my policy, regardless of whether this industry was essential to the particular locality in which I might be located. I would look out for my good customers.

"If a dealer in automobiles brought a lot of paper to me for discount, if I were satisfied with the sol-

venency of the dealer, with the value of his indorsement, if he did not wish an excessive line of credit all told which was out of proportion to the average balance carried with me, or out of proportion to the credit which I might feel I should grant to merchants and other lines of industry which were dependent upon my institution for credit support, I would take his offerings.

"If, on the other hand, I felt that he was disposed to do too large a business for his capital and was undertaking to get from me, for the purpose of further expanding his business, an unduly large line of credit, I would hold him down under any circumstances. In that place I would scrutinize his paper. If I found he offered the paper of a man with whose credit standing I was perfectly satisfied, whom I

knew was able to pay his obligations at maturity, I would take it. If, on the other hand, he should offer a paper of a man who had not credit rating, no responsibility whatever, who had merely bought an automobile, paying probably 10 per cent in cash and wanted to give his note for the rest, I would decline to take that paper, because I would doubt the maker's ability to pay it.

"Certainly, a well-managed bank does not want to become a dealer in second-hand automobiles.

"Now, there is the whole proposition. There hasn't anything been done by the Federal Reserve Board, and in most cases nothing has been done by any Federal Reserve Bank that reflects in any manner upon one of the greatest industries in this country. It would be a very serious thing

for any body of men to undertake to make an attack to destroy a business that is as firmly rooted and which has so many of the elements of essentiality as your business has, and I want to assure you that as far as the Federal Reserve Board is concerned, no such attempts have been made.

"I think the whole trouble, the whole misunderstanding, grows in very large part to the reluctance on the part of some good bankers, and you all know there has been very much of a credit strain all over the country that bankers are continually being asked to make loans that they feel they ought not to grant, and yet very few bankers, comparatively few, have the knack of saying no without giving offense. The average banker is very much averse to offending any customer.

"A bank hates to lose an account, and sometimes even an account that is regarded as an excessive borrowing account. They look back in the ledgers and they find a few months ago or a few years ago this particular account was not a borrowing account, but kept a large de-

(Continued on page 643)

The Voice of the M. A. M. A.

RESOLUTIONS: It is the sense of the Motor and Accessory Manufacturers' Association representing the principal makers of automotive parts and equipment, and assembled in convention at Cleveland, Ohio, Sept. 16 and 17, 1920, that:

The automotive vehicle, as represented by the passenger car and motor truck, is an essential factor in the transportation system of our country.

The promotion of adequate means of transportation and facilities therefore is most desirable. Therefore, the active support and indorsement of the Townsend Bill for a national system of highways becomes the responsibility of each and every member of our association.

The curtailment of credits by banks of the country has adversely affected all industry. The automotive industry being the third largest of the nation has naturally been curtailed, at least proportionately. Being as it is, an essential industry of basic soundness needs, its permanence and future successful growth is assured. The Federal Reserve Board has recognized adequate transportation as one of the first national needs of importance, classed as only secondary to food, fuel, clothing and housing.

Avery 2-Plow Tractor Has 6-Cylinder Engine

This addition to an already extensive line of power farming machines is especially designed for field and belt work on small farms and the lighter work on large farms. The engine is vertical, 3 x 4 in., cast in block type, detachable cylinder head, and is built by the company for this machine.

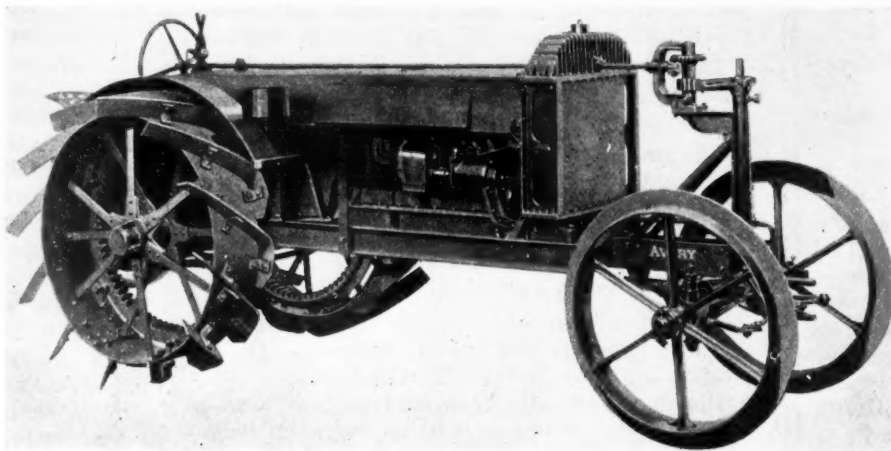
THE newest addition to an already large family of agricultural machinery is the Avery model C. This is an enlarged edition of the former motor cultivator, model B. While it has not been given a rating, it is understood to be a two-plow machine. It is especially designed for doing field and belt work on small farms and for the lighter work on large farms.

The engine is a six-cylinder vertical, 3 x 4 in., cast in block type with detachable cylinder heads and built by the company itself. It has heavy, drop-forged connecting rods, and a large crankshaft, 1 $\frac{3}{4}$ in. in diameter, which is mounted in three large main, die-cast bearings. The engine is equipped with a centrifugal governor of the throttling type, which is entirely inclosed and runs in a spray of oil. The governor is mounted on the magneto drive shaft and driven by the magneto timing gears. Magneto ignition and a com-

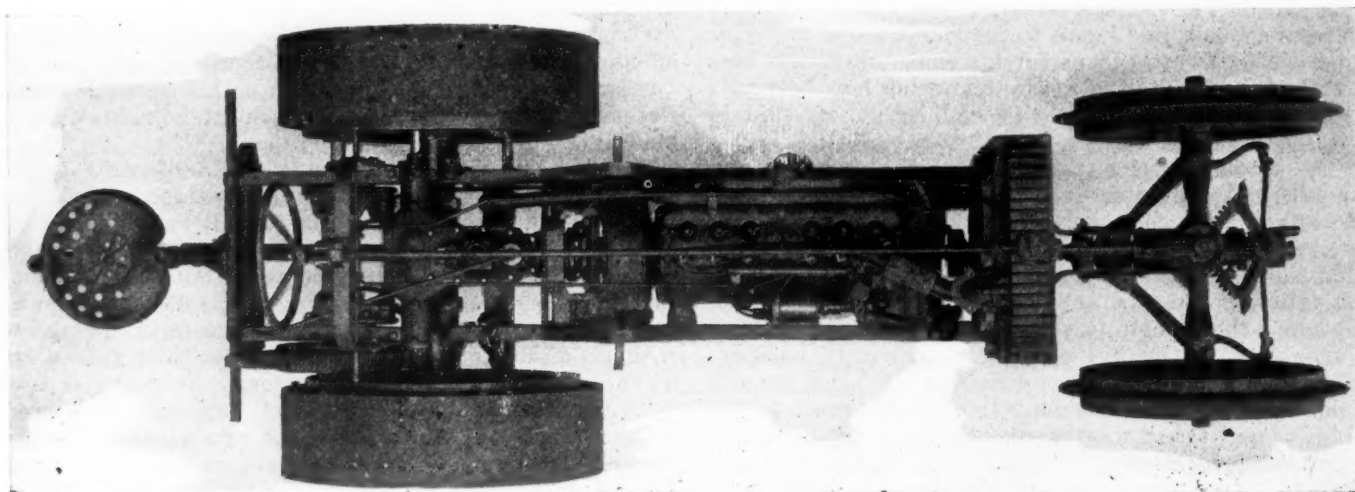
bination circulating splash and pump system of lubrication are employed.

While this machine is recommended to burn gasoline, many owners are said to burn kerosene, as the engine is equipped with a combination hot manifold. The fuel tank is mounted under the engine hood, is easily accessible, and has a capacity of 10 gal. Cooling is by thermo-siphon and a cellular type radiator and is assisted by a 15 $\frac{1}{2}$ -in. fan which blows air through the radiator and is driven at a speed of about 2400 r.p.m. The clutch is of the company's own make and is of the multiple disk, dry plate type.

The transmission is of the selective sliding gear type. All the gears in the transmission case are of chrome-nickel steel and heat treated. The transmission case is equipped with roller and ball bearing throughout. The three selective speeds are: 1 $\frac{1}{2}$ m.p.h., low;



Avery Model C Six Cylinder Light Farm Tractor



Plan view of Avery Model C tractor

2 1/8 m.p.h., intermedite; 4 1/4 m.p.h., high. The reverse is 1 1/2 m.p.h. The working speed, the intermediate, is in direct drive, to obviate gear resistance.

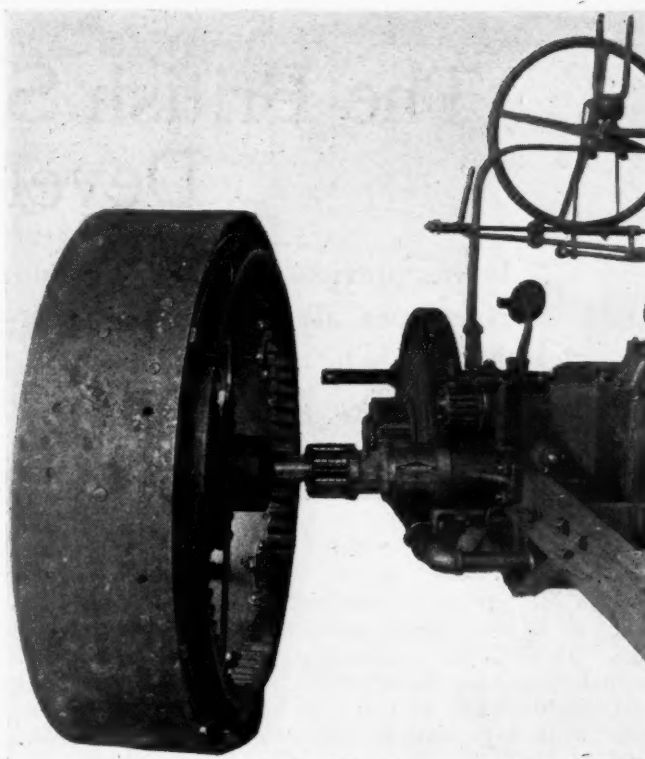
The final drive is through gears of 2 1/4 in. face, of heavy pitch, and the pinions are semi-steel. The drive is transmitted to both rear wheels to obviate frame distortion. The bull gears are cleaned and lubricated by the exhaust from the engine, which is piped to both gears. There are two drive wheels which are built up of steel, they are 38 in. in diameter and 10 in. wide, and run on roller bearings. A special universal cleat has been designed for the rear wheels, which is claimed to have the features of smooth rolling, good cleaning, good traction and the elimination of side thrust.

The front wheels are 28 in. in diameter and are provided with high bands or center rings, cast integral with the wheel to prevent skidding.

The rear axle is 2 in. in diameter. The front axle is of the automobile type and has a swivel connection with the frame at the center. In order to obtain a short turning radius the frame is narrowed at the front, permitting the steering wheels to be swung around farther.

This tractor is of narrow width, 50 in. and low height, 54 in.; its length is 136 in. and it has a 90-in. wheelbase. The turning radius is 11 ft. The height to the drawbar is 12 in.

The machine is regularly equipped with a seat, platform, tool box and rear wheel housings. Special equipment includes extra side guards for orchard work, an air cleaner and a special belt pulley.



Showing roller bearing on rear axle of Avery tractor

Motor Scooters in Europe

THE need for a light, cheap and simple motor vehicle for many purposes has brought out the class of motorcycles known as scooters. France has recently adopted the name "Trottinette" as being more descriptive of the machine itself. The idea of a scooter is by no means a new one. Several were built in this country before the war. The Scooter Club of France has defined a scooter as a two-wheeled motor vehicle with a piston displacement of less than 175 cc. (10.7 cu. in.) and with no encumbrances for the legs. Some are equipped with seats.

The manufacture at the present time is confined to Europe and the principal types are made in France and England. After the signing of the armistice it was stated in many quarters that the scooter was a solution of most of the problems arising from the serious state of the transportation facilities and that they would be produced by the thousands for a selling price of about \$125. This prediction has not been verified, and the reaction has been rather disastrous to the type. In France competitions have been organized by various organizations, including the recently formed scooter club, for the purpose of demonstrating the machines and encouraging developments.

The uses of the scooter are many, both for pleasure and in business. They are used in many factories, where the floor space is great, for messenger service. Also for the same purpose where the different parts of the plant are separated. For this use they are very economical and convenient. Some of the French manufacturers are making models equipped with small boxes for packages. For pleasure use around a summer resort where the various points of interest are separated by comparatively short distances and the roads or paths between have smooth and hard surfaces, they are quite popular. In the cities, with their paved streets, the uses of such a vehicle are many.

The outstanding features of the present day scooters are ease of control and lightness. In the majority of the models the speed is controlled by one lever on the handle bar. The brakes are usually controlled by a pedal on the floor. Steering is by the conventional handle bars and front wheel fork. Protection from mud is furnished by the floor in some models, by the more conventional mud guards in others and by a combination of the two in the rest. The early machines did not have seats, but these are coming to be a standard fixture now. Starting is affected by pushing the machine, as the engine is so small that very little effort is required. The relatively high gearing helps this also.

The engines are usually located at the rear, which simplifies the transmission to the drive wheel. The engines are all single cylinder, air-cooled of either two or four stroke cycle. The control, as stated above, has been simplified to the limit of one lever on the handle bar. The average horsepower is 1 1/2 and the limit placed on the piston displacement by the French scooter club seems to accord with practice. Ignition is by magneto. Some of the models have electric lighting, but this is usually an extra.

The present price, at normal exchange, is in the neighborhood of \$200. This figure is above that predicted for the type, but may be due to the general high cost of everything all over the world. There is undoubtedly a use for such a vehicle as a scooter in many fields. Many buyers find that the machine which they bought as a sort of toy is in reality a very useful article. The French Government requires that a motorcycle license be taken out by any one who wants to drive a scooter. This stand has aroused a storm of protest on the ground that any child can learn to drive a scooter in a half an hour and that a scooter in motion is no more dangerous than the ordinary bicycle.

The British Single Deck Bus Development

In his previous articles, Mr. Bourdon has considered only the London type buses, all of which are built with the double deck body in mind. In this article he considers the single deck buses, popular outside of London, and suggests how the London chassis can be adapted to this type.

By M. W. Bourdon*

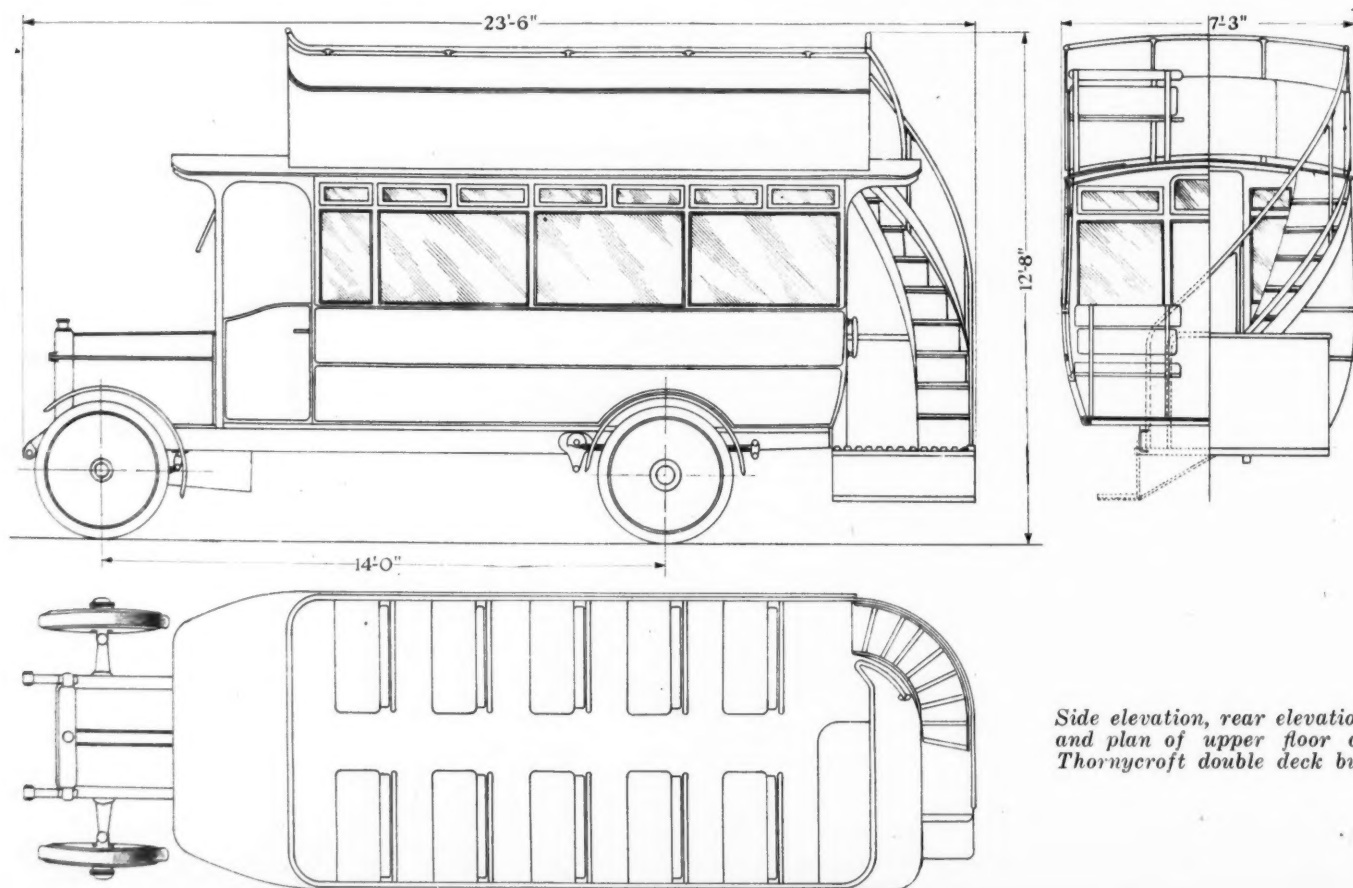
IT is probable that in the United States the British motor bus is very widely if not entirely associated with the type of superstructure used almost without exception in the London services, viz., the double deck body. As a matter of fact, at the present time there are in England far more bus bodies building—and there are probably quite as many in use—of the single deck type. It is very unlikely that there would have been any field at all for the double deck bus had it not been for the almost unique circumstances in which motor bus services in the metropolis have to be operated.

The double deck bus was, back in the old horsed omnibus days, essentially a London production. But it is a curious fact that this type of body, either horse or motor

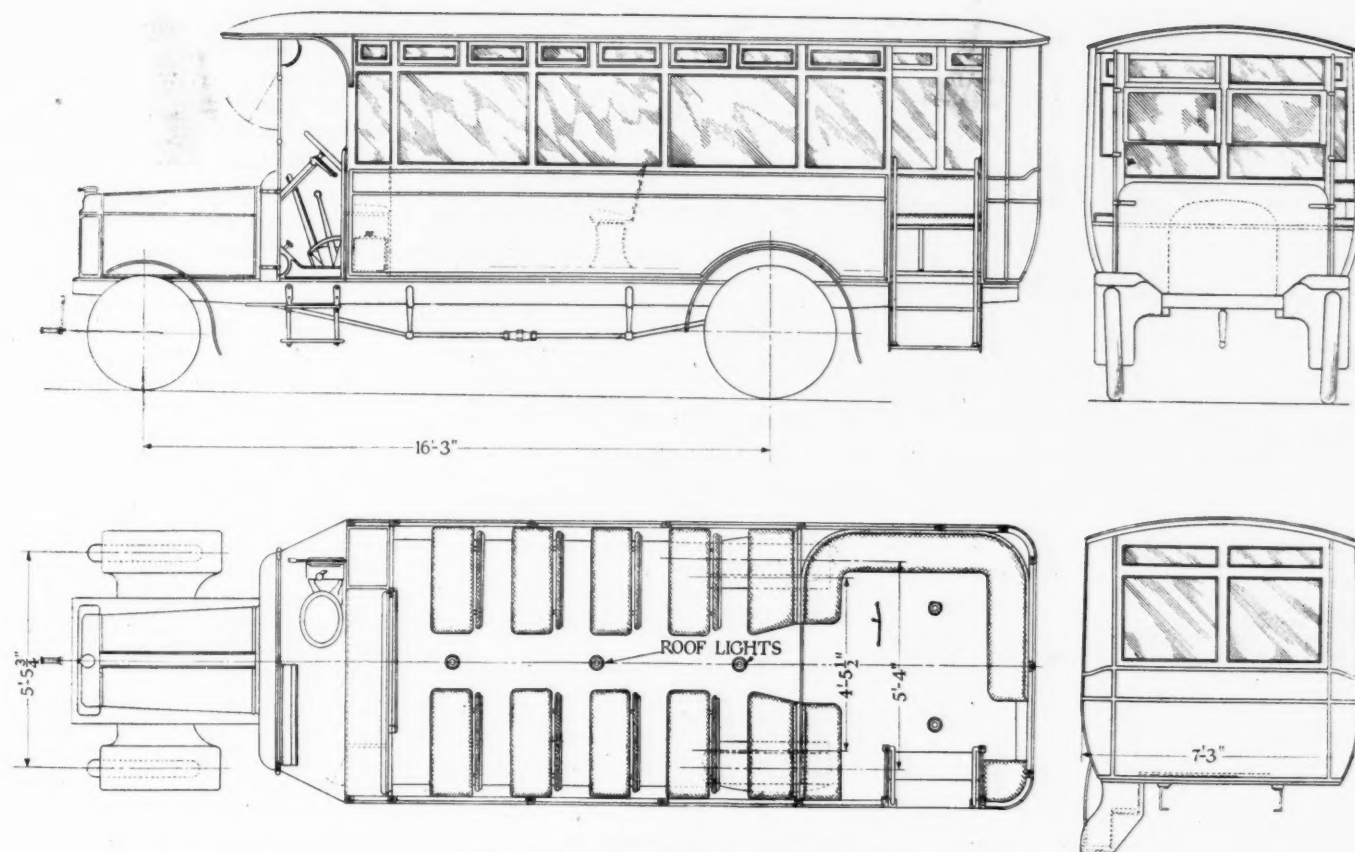
drawn, has never been popular or generally used outside London. In London its development has been favored by the absence of low bridges, overhanging trees and telegraph wires, etc., and the need for moving the maximum possible number of passengers per vehicle from place to place. The restrictions imposed by the London licensing authorities on length of bodywork and chassis have also, since motor buses came into use, favored the double deck type.

It cannot be denied that the double deck body is at a serious disadvantage in the matter of loading and unloading, and one would have imagined, therefore, that, as the expeditious handling of off-going and in-going passengers is of great importance in London, where traffic is so congested, and unnecessary delays are to be avoided, a single decker with front entrance and rear

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Side elevation, rear elevation and plan of upper floor of Thornycroft double deck bus



Four views of Leyland single deck bus

exit would have been preferred. But the single decker cannot be made to carry the same number of passengers as a double decker on the same length of chassis and bodywork, so that, although the type just suggested would reduce the time spent at stopping places, the additional number of vehicles that would be needed to cope with the traffic would almost certainly cause more congestion in the streets than the delays in question.

One disadvantage of the double decker is the fact that the outside passengers are compelled to pass down a narrow staircase and the oncoming passengers cannot get up until the others have descended. Inside and outside passengers have to use the same loading platform, though, certainly, the new "K" type London bus body shows improvement in this respect—the more roomy platform allows the one stream to pass on or off forward of the central pillar or standard while the other stream moves to or fro behind it. In bad weather, too, there is additional confusion and delay caused by the scramble on the part of most of the passengers to get inside the bus, and vice versa on fine days.

Various remedies have been attempted in the way of double staircases and double doors, so that passengers could get on and off at opposite ends. But these plans have not been successful, partly on account of the apparently impossible task of educating the public to use the entrance and exit in the way intended; in addition, valuable space is occupied by the second platform and staircase.

For provincial services in England—in country districts, in small towns, and in cities where the vehicular traffic is not very considerable and streets are not congested—there can be no doubt as to the popularity and suitability of the single deck body on account of its greater stability, lessened wind resistance, weather protection for all passengers, safety from overhanging trees, etc., notwithstanding, too, that in summer the "stuffiness"

of the interior is difficult to prevent without setting up draughts of which many passengers complain.

A few single deck bus bodies seating 34 passengers in comfort are in use in provincial England, but this capacity can only be attained by using a longer chassis or greater overhang than is permitted in London, where, until recently, no double deck bodies have seated more than that number of people, inside and out. On the average, the single deck bus accommodates about 26 passengers, though one big provincial service's vehicles take 33 each, two passengers being allowed to sit alongside the driver—an arrangement neither allowed in London nor desirable in congested thoroughfares, owing to the possibility of the driver's attention being taken off the road and the traffic in front of him by the remarks of the people on the seat alongside.

In a few services experiments have been made in the way of providing gangway seats in single deckers, but these have proved a failure on both town and country routes. It has been found far better, if a vehicle must be overloaded, for the excess passengers to stand. This brings forward the question of which is preferable, front or rear entrance, for single deck bodies. It is a problem which has been discussed at great length by operating engineers, and the views put forward can be summed up as follows:

The Front Entrance; Points in Favor. The front entrance body induces fewer draughts, as, except when the side ventilators or lights are open, there is no exit for the air and therefore no encouragement for it to enter at the front. The body interior is warmer in winter when all windows are shut, as the heat from the engine tends to rise into the seating space. (In the writer's opinion this is a doubtful advantage, though a point which has been put forward in favor.)

It is claimed that space at the front of the body is utilized which otherwise would be wasted, and that there



Folding top seats reached by detachable steps. Type of body used mainly for pleasure trips

is no bulkhead across the front of the bus, thus making it possible to reach the clutch or gearset simply by lifting a floorboard, a not unimportant point in considering ease of maintenance. Further, it is put forward that the structure of the body is not weakened at any of its vital points; e. g., toward the rear end at the side, where racking stresses are concentrated.

Another point put forward in favor of the front entrance is that, as excess passengers persist in attempting to stand near the entrance, wherever it may be, the stresses caused by imposing an undue proportion of the load behind the rear axle is avoided. In this connection one operating engineer has said: "I have known chassis side frames to crack close to the hold-down bolts of a rear entrance bus. The cracks, having started at the top of the frame members, convinced me that overweight at the rear, combined with bad roads and the cantilever action of the frame every time the rear wheels drop into a pot-hole or rut, was the cause. These fractures would not have occurred, in my opinion, if the bodies had been of the front entrance type, as the passengers therein have the same tendency to keep near the door and the extra weight is, therefore, more equally distributed over the whole chassis."

In Favor of the Rear Entrance. Among the points advanced in favor of the rear entrance body are:

There is less stuffiness inside in hot weather, as no smells or heat can pass in from the engine space. Stops are less frequently called for, as agile passengers—probably 40 per cent of the total—can alight while the bus is moving at any speed below eight miles per hour. The driver's attention is not liable to be distracted from the road by direct appeals that he should stop the bus, or by other requests or remarks from passengers. The entrance can be made more convenient for entering or alighting, as the steps can be made easier for elderly people, which means a great saving on short runs and makes for quick service. Overloads in town services occur usually at certain times of the

day only, and for short distances; if agile passengers can enter and alight easily—as with a rear entrance—they are encouraged to make short journeys when otherwise they might walk.

Designing the Chassis for the Body.—The automobile manufacturer intending to enter the bus field would do well as a preliminary to consider carefully not only the nature of the work the chassis will be called upon to undertake, whether, for example, it may run in hilly or flat districts, in congested thoroughfares or in urban or rural areas, but also the type of body it will most often have to bear. If a double deck body is meditated, an important essential is, obviously, to keep the center of gravity as low as possible.

Clearly, this affects axle design directly and with it the type of final drive, in view of the need for maintaining ample ground clearance. If worm gear is not favored, the double reduction gear is a good alternative, but straight pinions and bevels are not desirable on account of the difficulty of silencing them—and it must be remembered that a bus body acts as a very efficient "sounding board." Skew teeth for the pinions and helical bevels occur as a possible combination to secure quietness of running with a fairly light axle and good ground clearance.

For either a single deck or double deck body to hold the greatest number of passengers on a given wheelbase, the positioning of the driver's seat alongside and higher than the engine—as in the new "K" type London buses—offers an opening toward the desired end. And in this connection it will be found that, even although the licensing authorities may not impose a restriction upon length of wheelbase and overall length, operating engineers will do so in most cases. The same applies to the maximum weight.

Undue length of wheelbase and unladen weight beyond a certain limit are undesirable from the operating companies' point of view. There is a distinct limitation on the overall size of the vehicle in considering efficient operation, and the carrying of the greatest possible num-



Thornycroft front entrance, single deck bus with provisions for carrying baggage on roof

ber of passengers is desirable only when that object is attained while observing that limit of overall dimensions. Cumbersome units do not constitute the most paying fleet, for traffic has its ebb and flow, and although during the "rush" hours a bus with a wheelbase of 20 feet and a capacity for seating 60 or 70 passengers might be desirable, it would be an uneconomical unit to operate during most of its working hours.

Compromise—very carefully thought-out compromise—is needed to produce a satisfactory bus chassis and body. The traffic superintendent may demand the utmost seating capacity, but the operating engineer, with his mind on running costs, knows that it is better to lose \$10 in fares during 4 or 5 hours of the day than to run a half-empty bus of excessive dimensions for 5 or 6 hours on each side of the rush period.

In embarking upon the design of a bus chassis, the experience of British manufacturers and operating engineers might well be taken advantage of. And no better example of efficient design and operation can be cited than the "K" type chassis and bodywork of the London services.

True, there are some modifications possible without jeopardizing satisfactory operation; the flitch plate frame, for instance, might be displaced by one of pressed steel and of latticed girder pattern. The wheelbase might be increased to 190 inches and a 56-passenger body fitted for big city services. Other variations may suggest themselves on account of peculiar conditions of use in certain localities. But on the whole there can be no question that with 20 years of experience behind it the post-war London bus has reached a fine point in development. As far as overall dimensions go, it can hardly be varied more than a comparatively few inches in any direction without risking efficiency in operation.

Electric transmission has certain advantages in its favor; the absence of gear changing occurs immediately to mind, especially when it is realized that careful observations show that the London bus driver changes gear on an average 1200 times every day. But electric transmission, so far as British developments have gone, im-

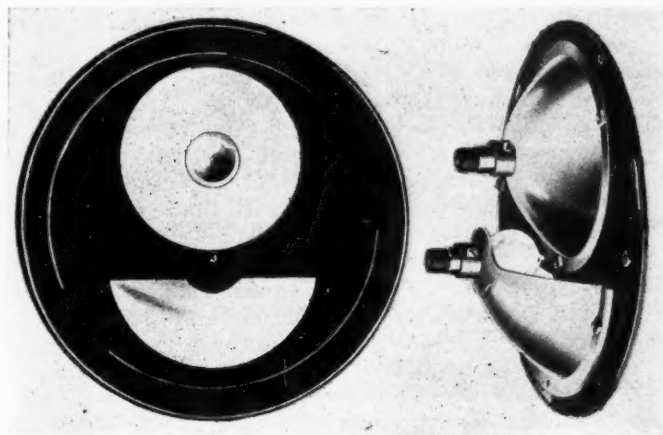


Interior of Leyland bus body

plies a considerably greater maximum chassis weight than does the usual selective gearing. In operating costs there is little to choose between the two systems—what is gained by eliminating gearset wear and tear is lost in the maintenance of the electrical units and the lower efficiency of the transmission.

Four Range Headlight

TO meet all night-driving conditions, the Alvo Mfg. Co. has developed a headlight which gives four different ranges of illumination. These are produced by the use of two reflectors, one above the other. The upper



Alvo four range headlight

reflector is 5 in. in diameter and the lower (which is cut off in the center by a horizontal shield), is 6 in. The upper reflector is a paraboloid, and the lower reflector half of one. Both reflectors are made of spun brass, with a polished nicked surface covered by a highly polished silver coating.

The upper reflector throws a conical beam of light illuminating the road 500 ft. ahead and lighting both sides within a wide radius. This range is said to be ideal for country driving. The second range is that of the lower reflector alone, which should be used for city driving or when meeting other machines. It is said to meet all traffic regulations. The lamp bulb is entirely hidden from view and no direct rays can reach the eyes of approaching motorists.

In driving over rough roads or in foggy or stormy weather, both reflectors may be used together, this constituting the third range. The fourth range of light is that of the lower reflector with the lamp dimmed by resistance. This range is for use in parking, and with it less than 2 amperes of current are consumed. The various ranges are obtained by means of a switch on the dash.

Experimental Centrifugal Oil Cleaner Attached to Liberty Engine

This experimental work under way at McCook Field is of particular interest to tractor manufacturers, who have been especially annoyed by the accumulations of damaging foreign substances in the oil circulated in the engines. This device has operated very satisfactorily in laboratory tests.

THERE is under development at McCook Field a centrifugal oil cleaner which, from preliminary tests, promises to be of considerable value. Tractor manufacturers are particularly interested in oil-cleaning devices, and it may be that valuable lessons can be learned from the experiments to be described.

This device was designed and developed by the Installation Branch, Power Plant Section, and constructed in the shops at McCook Field. It consists of a spun copper bowl 5 in. in diameter and 1½ in. high, mounted in a modified Liberty oil pump. This bowl is driven by a steel shaft which is splined into the lower oil pump gear of the Liberty-12 oil pump. This shaft is supported at the top by a bronze bushing in the oil pump casing and the lower end of the shaft is supported by a bronze bushing in the center of pump housing cover. This bushing has a flange to take the thrust. The speed of this shaft is 1½ crankshaft speed.

A short curved aluminum pipe, ⅝ in. in diameter, leads from the oil intake elbow to the center of the bowl, and the outlet of this pipe is below the top edge of the bowl. The oil pressure regulating valve was removed from the inside of the pump casing and mounted on the outside to give room for the bowl. The regular intake opening in the pump casing is plugged and the intake elbow raised about 1 in. so the curved intake pipe will enter above the edge of the bowl. The standard screen is omitted.

Principle of Centrifugal Oil Cleaner

The oil is led from the oil tanks to the inside of the bowl, which is rotating at 2550 r.p.m. when the engine is turning up 1700 r.p.m. The oil is set awhirling and any foreign matter held in suspension, if of greater specific gravity than the oil, will, by virtue of the centrifugal forces acting thereon, be thrown and held to the inside edge of the bowl. The force in this case is about 45 times that of gravity.

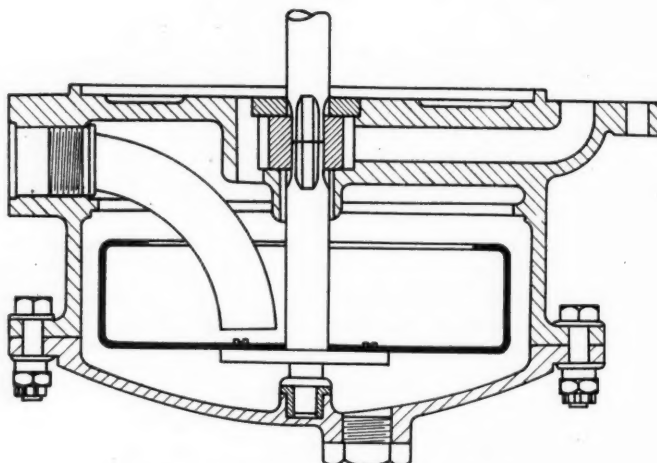
The first run was made with 4 gal. of oil taken from the tanks of an airplane which was about ready for the customary 5-hr. change of oil. The oil was heated to 130 deg. Fahr. and run through the cleaner five times,

the bowl rotating at a speed of 2700 r.p.m. A few drops of this oil were put on a piece of clean glass and no grit could be detected, whereas a few drops of the same oil before going through the cleaner showed the presence of fine grit and was darker in color. The residue left in the cleaner bowl was very thick, and contained no appreciable amount of grit, such as sand, carbon and metallic particles.

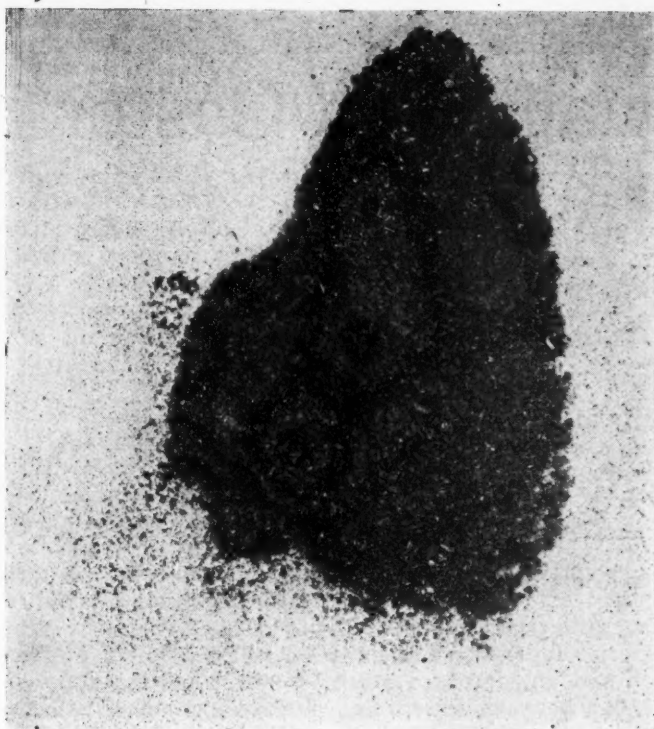
The next series of runs were made with cold castor oil, which is clear, and this was mixed with fine emery powder, metallic filings and sand. This changed the color to a dark gray and the heavy castor oil held the emery, etc., in suspension. When this mixture was run through once it emerged as clear as it was before it was mixed. All of the emery, metallic particles and sand remained in the bowl. The speed of these runs varied between 1800 and 2800 r.p.m. It was then decided to put the oil cleaner on a standard Liberty engine and test it under running conditions.

A Liberty-12 engine that was about to undergo a routine test on the torque stand was selected. The engine was run for 10 hours at 1650 r.p.m. The pump was then removed and disassembled, the oil was emptied and the inside of the bowl carefully examined. The inside edge of the bowl was covered with a gummy deposit and imbedded in this deposit was found a variety of substances. In order to examine this deposit more clearly, it was scraped out and diluted with gasoline; then the resulting mixture was passed through filter paper. When the deposit was dry, a photograph of it was taken, and then in order to determine the iron and steel contained therein, a magnet was placed underneath the paper.

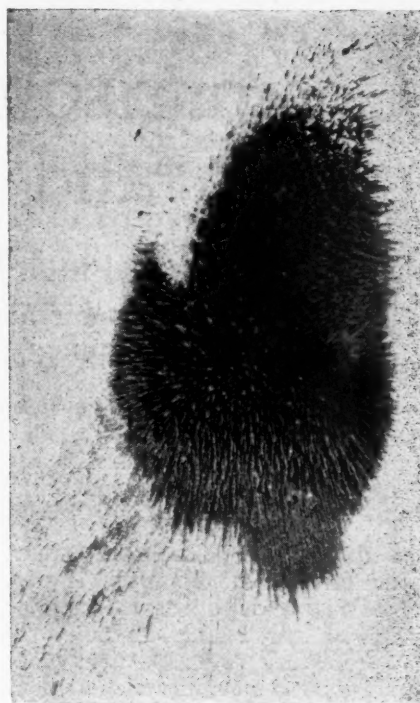
These particles were examined under the microscope. The gummy substance was dissolved by the gasoline and therefore it was impossible to determine its composition, but further study will be made of this deposit on the next tests. It was noticed, however, that this gummy deposit was of benefit to the operation of the cleaner in the following ways: Lint and other substances which have a lower specific gravity than oil were stuck to it, and all grit was held in place so it could not mix, when the engine idled or stopped, with the oil after it was



Section through experimental oil cleaner



Particles taken from centrifugal oil cleaner after a 10-hour run on a Liberty-12 engine



Particles taken from centrifugal oil cleaner after a 10-hour run on a Liberty-12 engine. Magnet placed underneath to show presence of iron and steel

once caught. It was necessary to scrape the deposit from the sides of the bowl.

Discussion

Tests on the centrifugal oil cleaner indicate that a great deal of grit can be collected from the circulating oil of an engine. The question arises as to the source of the grit that gets into an engine. A study of the grit collected from the 10 hr. run reveals a large amount of iron and steel which must be from the piston rings and cylinders. A large percentage consisted of a very fine aluminum powder which must have come from the pistons. A small quantity of bronze powder was observed, also babbitt bearing metal. All of the above undoubtedly came from the working parts of the motor. Small chips, which resembled chips from machinery processes, were present, sand varying from very fine powder to small pebbles and carbon in various forms and sizes were also found. The sand is probably from the core sand that could not be cleaned out of the casting, and carbon particles may have baked on the under side of the piston head and fallen off. There were also found

small brown particles that looked like sand but would crush easily, and the conclusion was reached that these were made up of dust taken in through the breather. The power required by the separator at 2250 r.p.m. varies from 1 hp. at 75 deg. Fahr. to 0.35 hp. at 190 deg. Fahr.

It is impossible to state at present the extent of damage to the bearings and pistons caused by grit in the oil, but it is evident that a wearing away of metal is constantly going on when an engine is in operation. If these metal particles that wear off can be taken out of the lubricating oil as soon as they get in, the oil film will be less likely to break down and the oil will not have to be changed so often. All the grit collected in the 10-hr. run will, with the exception of a few pebbles, pass easily through the screen provided in the oil pan of the Liberty engine.

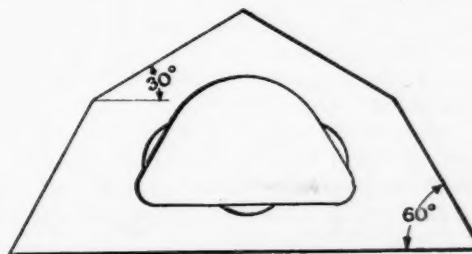
This device functioned satisfactorily in the above tests, and it has been concluded to build four more for flight tests. It has also been decided to make a 50-hr. test, under identical conditions, of two Liberty-12 engines, one with and one without the oil cleaner and then examine the bearing surfaces for wear, smoothness, etc.

Draftsman's V Thread Triangle

A DRAFTSMAN'S triangle which is very handy in drawing screw threads is illustrated herewith. It consists of a pentagonal shaped piece of celluloid or fiber with the angles so disposed as to give the upper sides an angle of 30 deg., and the lower sides an angle of 60 deg. to the base and the opposite sides normal to each other.

It may be seen in referring to the sketch that in drawing V threads in views where the center line of the threads is normal to the straight-edge or T square, the upper edges of the triangle are used, and in cases where the center line of the threads is parallel to the straight edge, the lower edges are used. This triangle is the in-

vention of K. D. Vosler, who has applied for a patent on it.



A Comparison of Qualities of Castor and Mineral Oils

Much prejudice and little clear reasoning is evidenced in a careful comparison of the vegetable and mineral oils for use in internal combustion engines, as Mr. Ziesenheim shows in this article. His investigations show clearly why any advantage exists. Results of tests are given in this article.

By Fred C. Ziesenheim, M. S. A. E.

CASTOR oil has always been preferred for the lubrication of internal combustion engines subjected to severe and exacting service, particularly for aircraft and motor car racing engines. The reasons given for the preference reveal a variety of conflicting opinions and prejudices, most of which do not agree with the known chemical and physical characteristics of the oils.

An examination of the physical characteristics of castor oil discloses that it has a greater ability than mineral oil to form and maintain an oil film. Investigations have shown that this results from the presence of free fatty acids, and that this same property can be given to mineral oils by the addition of small percentages of free fatty acids.

Development work on aircraft engines has demonstrated that engines which supposedly would not run on other than castor oil, can be operated satisfactorily on mineral oils if suitable changes are made, such as increased bearing clearances and less restricted oil channels.

An oil for use in internal combustion engines may be considered from two viewpoints—as a material for preventing metal to metal contact of sliding surfaces, and as a material subjected to high temperatures and exposed to flame in the combustion chamber.

The lubricating property of an oil is its ability to prevent metal to metal contact of sliding surfaces, with a minimum of friction loss. The viscosity, being a measure of the relative fluidity of an oil, is an indication of its lubricating properties throughout the temperature range considered. One fallacy concerning castor oil is that its viscosity decreases less rapidly with increase of temperature than that of a similar mineral. Fig. 1, showing the temperature-viscosity curves of castor and a well known brand of heavy motor oil, indicates that this idea is entirely erroneous.

The lubricating property of an oil depends on some

characteristic other than its viscosity, since it is a well known fact that some animal and vegetable oils lubricate better than mineral oils of the same viscosity. The superior lubricant will have a lower coefficient of friction and an increased ability to form and maintain an oil film between the sliding surfaces, preventing metal to metal contact. It will be considered as being more "slippery," or as possessing the quality of "oiliness" to a greater degree.

Some of the physical properties of an oil other than its viscosity, which may influence its character

purely as a lubricant, are density, compressibility, tensile strength, and capillarity.

Density is not a determining factor, since there are numerous mineral oils of various densities to select from. Very little investigation has been done on the compressibility and tensile strength of lubricating oils, but the observations available do not indicate that they have any particular influence on lubricating performance.

The relationship between the adhesive and cohesive properties of a liquid determine its capillarity. Adhesion, the physical attraction existing between the materials when in contact, causes a liquid to spread or flow. Cohesion, the physical attraction existing within a material, for the material itself,

tends to concentrate a liquid into spherical form. Mercury is the classical example of low adhesive, and high cohesive attraction. Capillarity is the ability of a liquid to wet and flow over another material. If a liquid wets solid—that is, flows or spreads over it—it is evident that there is a greater adhesive attraction existing between the particle of the solid and liquid, than there is cohesive attraction between the molecules of the liquid itself. Capillarity induces oil to spread or form films; it causes oil to flow into narrower spaces of higher pressure. This is a very desirable feature from a lubrication standpoint, since the oil will tend to penetrate into the narrower and

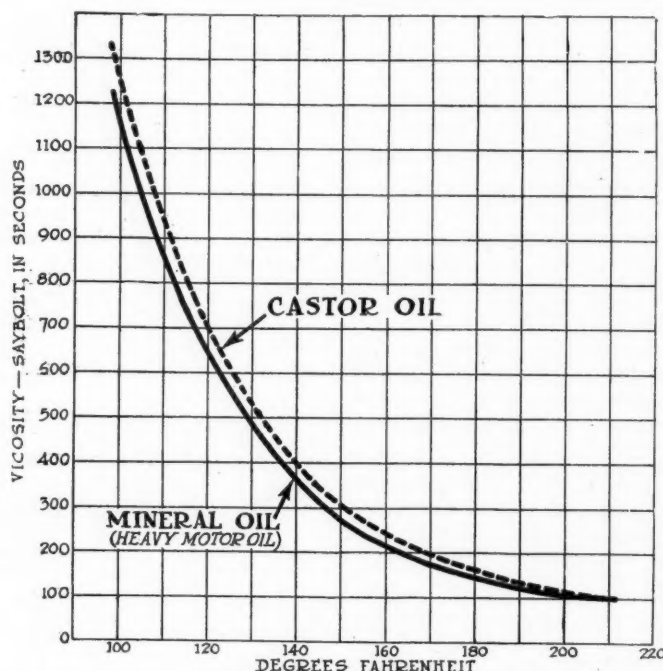


Fig. 1—Viscosity-temperature curves

more remote spaces of the journal and bearing, or other sliding surfaces.

One of the most important functions of an oil for internal combustion engines is that it forms and maintains a sealing film between the piston and cylinder walls, thus preventing the passage of fuel and combustion products. Increased capillarity induces a more rapid and tenacious spreading of the oil film over the entire sliding surfaces, thereby increasing the sealing effect.

The property of increased capillarity is the distinguishing feature which characterizes the superiority of animal and vegetable oils over mineral oils as lubricants.

Higher Capillarity of Castor Oil

Laboratory tests have established the higher capillarity of castor oil over mineral oil. Engine tests, particularly the development work done in adapting European aircraft engines for lubrication by mineral oil instead of castor, have likewise shown that the superiority of castor can be attributed to its greater capillarity. Clearances, which were sufficient for lubrication with castor, had to be increased and closer manufacturing limits maintained when mineral oil was used. Oiling devices which had been entirely adequate with castor had to be of increased capacity and rearranged to secure less restricted flow of oil to the bearing surfaces. In a rotary engine a cam follower had an oil hole which faced the engine axis. For running with mineral oil, the oil hole had to be placed on the opposite side of the bearing facing outward from the engine axis, otherwise the mineral oil would not flow to the bearing, being forced away from the oil hole by centrifugal action.

From the investigations of Wells and Southcombe (The Theory and Practice of Lubrication, Journal of Industrial Chemistry, Vol. 39, No. 51, March 15, 1920) increased capillarity and a reduced coefficient of friction can be obtained from neutral mineral oils by the addition of a very small percentage of free fatty acids such as are always present in animal and vegetable oils.

Free Fatty Acid

By the suitable selection of a mineral oil and a fatty acid, an oil can be produced for meeting particular lubrication conditions. Very satisfactory results have been obtained from the use of such prepared oils, on practically all classes of internal combustion engines. Practically no pitting or corrosion of bearing surfaces will occur from normal operation of an engine lubricated by an oil containing a slight amount of free fatty acid.

The presence of free fatty acids in any oil, whether mineral, animal or vegetable, has a decided influence on the rate of sedimentation of the carbon particles and other colloidal matter which may be present. Under the influence of acids, the colloidal particles become aggregates of larger mass, and settle out. The greater the degree of acidity, the more rapid the deposition. Acid washing is employed in refining processes for the express purpose of removing colloidal matter by sedimentation and filtration.

The presence of carbon particles in oil has no appreciable effect on its lubricating properties. A very small amount of carbon will, while in suspension, give the oil an inky black appearance, but the carbon particle, instead of being hard and flinty, is a minute fluffy flake incapable of injury to the bearing surfaces.

Since acids hasten the precipitation of carbon, all quiescent or fixed surfaces in contact with the oils will suffer a deposit of the carbon sludge, necessitating frequent cleaning of the oiling system, to prevent a diminution or stoppage of the oil supply. With acid free min-

eral oil, the carbon particle will remain in suspension, and most of the carbon can be removed by simply draining the crankcase of the used oil.

Engine tests do not indicate any apparent difference between castor and mineral oils as regards their stability and resistance to heat decomposition. The flash and fire tests of castor and mineral oils recommended for the same class of service, are usually of similar values.

The carbon formation obtained from castor oil is a tough, gummy, somewhat elastic deposit, which is usually greater in amount than that obtained from mineral oils. The nature and amount of carbon obtained from mineral oils depends primarily upon the base of the oil. Paraffine base oils give a considerable amount of hard carbon. Asphaltic base oils give a smaller quantity of soft, sooty carbon. The carbon obtained from castor oil is characteristic of the oxidation of vegetable oils, in that an elastic gummy film is produced. Linseed oil is used in paints because of this particular property.

Castor oil has been preferred for the lubrication of those rotary engines which distribute the fuel and air mixture through the crankcase, because castor is not miscible with gasoline, whereas mineral oils and gasoline do mix to a certain extent. Engine tests over a considerable period of time have failed to show that the miscibility of the fuel and oil is a deciding factor in the selection of a lubricant for this class of service.

Conclusions

The superiority of castor oil over mineral oils for particular conditions of service is due primarily to its greater capillarity, or its greater ability to form and maintain a lubricating film. This greater capillarity results from the presence of free fatty acids. Increased capillarity can be given to mineral oil by the introduction of a free fatty acid.

A treated mineral oil can be produced that is capable of satisfying any particular lubricating condition, obviating the necessity for using pure castor oil.

Oils containing a free acidity deposit their carbon particles by sedimentation. This necessitates a frequent cleaning of the oiling system. An acid-free mineral oil retains its minute carbon particles in suspension. The carbon particles, which give the dark appearance to used oil, are not injurious to bearing surfaces.

Less carbon deposit is formed in the combustion chamber from mineral oils than from castor oil.

By analyzing the lubricating conditions of a particular engine, the engine can be designed and manufactured so that neutral mineral oils free from fatty acidity will give satisfactory lubrication, rendering the use of the more expensive castor oil unnecessary.

Story of the Naval Consulting Board

CERTAIN phases of the work of the Naval Consulting Board are of particular interest to the automotive industry. A bulletin issued in 1918 on "Problems of Aeroplane Development" is included in the book, entitled "Naval Consulting Board of the United States," recently issued by the Government Printing Office. The author is Lloyd N. Scott, late Captain U. S. A.

A record of the organization and activities of the Naval Consulting Board with special reference to the industrial preparedness campaign, the fuel oil investigations, the work of the ship protection committee, the laboratory work, and the inventive accomplishments of the members of the board. Other chapters treat of the origin and development of the Board, functions of the various organizations, inventions from the public, branch offices, etc.

Increasing Power Press Safety Without Reducing Production

Power presses have always been known as dangerous machines. It has been difficult to render them safe without materially reducing their production possibilities. A number of devices that have been put in use to accomplish this successfully, however, are described in this article.

By C. A. Briggs*

POWER presses, some great lumbering masses of metal and others little nervous, snappy ones, both of which have claimed fingers, hands and arms from industry till the count has stopped, are at last being muzzled. Changes have been made so that they may no longer be rated as the most dangerous of machines.

This change has been made in most instances by combining safety with efficiency, rather than by obtaining safety at the expense of efficiency. Improvements have been made in the press itself, its dies and methods of operation, so that in many instances it is unnecessary for the operator or helper to reach under the ram. Where reaching under cannot be avoided, devices have been installed to insure the removal of the operators' hands before the ram descends.

Probably the greatest advance in making these power presses safe has been made and will be made in re-designing the press and dies and improving the methods of operation.

The manufacturer of power presses is frequently condemned for his failure to adequately equip his machine

*Safety Director, Willys-Overland Co.

with safety guards and appliances. Such criticism is not entirely justified as an examination of the manufacturer's position will show; he has several defenses.

The buyer of power presses is usually concerned primarily with production, and a number of safety devices hinder rather than aid production. In such cases the manufacturer feels that the responsibility for safety lies with the buyer. One large manufacturer, however, keeps on hand booklets describing all the safety devices and turns them over to any customer who is interested.

Most power presses are capable of doing a variety of work, while the safety devices are, in most cases, adaptable to only a single type. Thus if the presses were equipped with any particular safety devices, they would be useless for any other kind of work. The exact nature of the work for which the press is to be used is not known to the manufacturer when the machine is made, thus it would be impossible for him to equip it with the proper safeguards.

There is undoubtedly a large responsibility which must rest somewhere and which either the manufacturer or the customer must assume if fingers and hands are



Fig. 1—Revolving die. Stock is automatically brought under the ram and after forming, drops through to pan beneath press



Fig. 2—A sliding die here allows the operator to draw the die out on the slide for placing the stock and then to push it under the die. The operator's hands are always in the safety zone

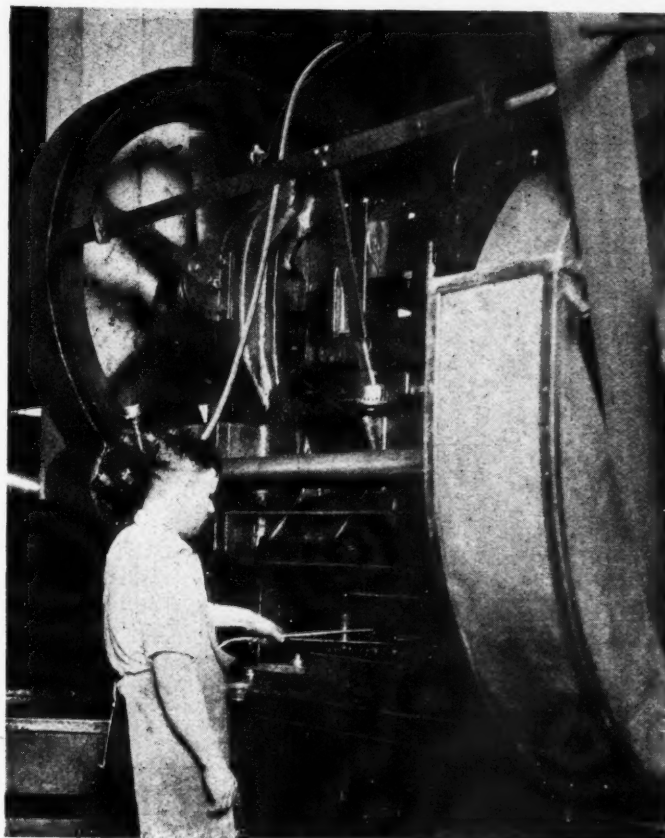


Fig. 3—Vacuum attachments for removing stock from dies without reaching in and endangering the hand

to be saved. It would seem that there is considerable "passing the buck" involved in the present situation.

Some of the most acceptable methods in use for removing hazards to operators are automatic feeds, roll feeds, chute feeds, revolving dies and sliding dies. The last two methods are shown in Figs. 1 and 2.

Vacuum devices for inserting parts and removing them from between the dies have also proved acceptable. Suction is applied to the rubber cup on the handle in employee's hand; this lifts the parts from the dies without bringing the hands into the danger zone. (See Fig. 3.) Similar devices, such as soft nosed pliers and hooks to draw the formed parts from the dies or to place them, are used without the danger of going under the dies with the hands or fingers. Another safety feature which has the advantage of being a wonderful help to production with a very small outlay for installation, is the air valve, Fig. 4, which releases a volume of air as the machine functions, blowing the small parts from the die into a stock pan. This makes it unnecessary for operator to go under the ram to remove these parts. Fig. 4 also shows a bar device which automatically locks it against hands prematurely placed under the ram. This is combined with a non-repeat attachment so arranged that should the operator carelessly leave his foot on the pedal after tripping the press, he will not get a second or repeating movement which might catch him unawares as he removes stock from the dies.

Accidents on presses doing a certain type of work can be entirely eliminated by removing the pedal trip and substituting a hand lever trip, as shown in Fig. 5. The act of reaching for the lever automatically removes the other hand from contact with the dies. The trip is made with less exertion than with the foot trip also.

Considerable trouble is often experienced because men on the opposite side of a large rail piercing press are

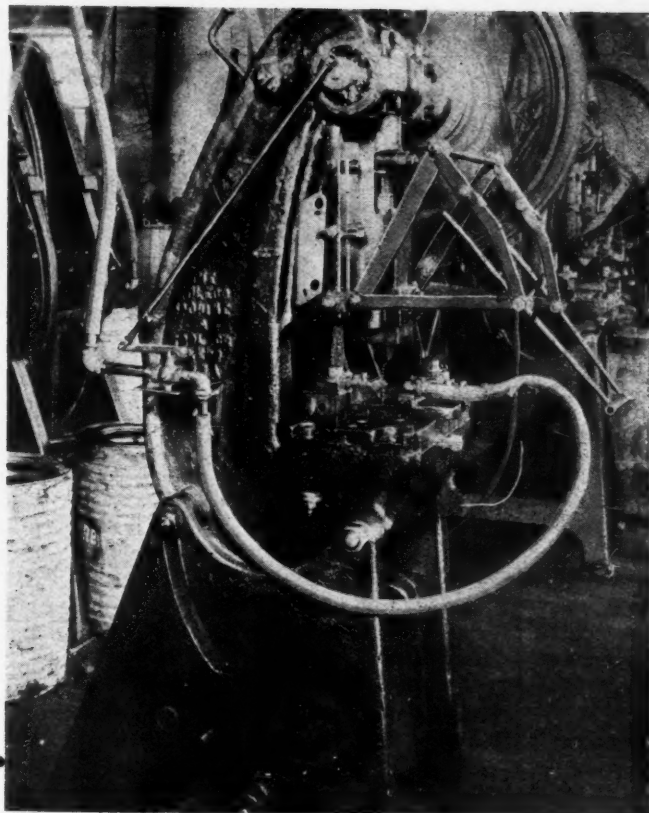


Fig. 4—Air valve blows the parts from die after each operation. Photograph also illustrates bar device which locks the press as operator raises it to place stock in die

not always warned when press is tripped. The operator has to see that all hands were at a safe distance before pulling the lever which brought the piercing dies down. This difficulty can be overcome by equipping the press



Fig. 5—Lever tripping which reduces fatigue and removes the hand from contact with the dies

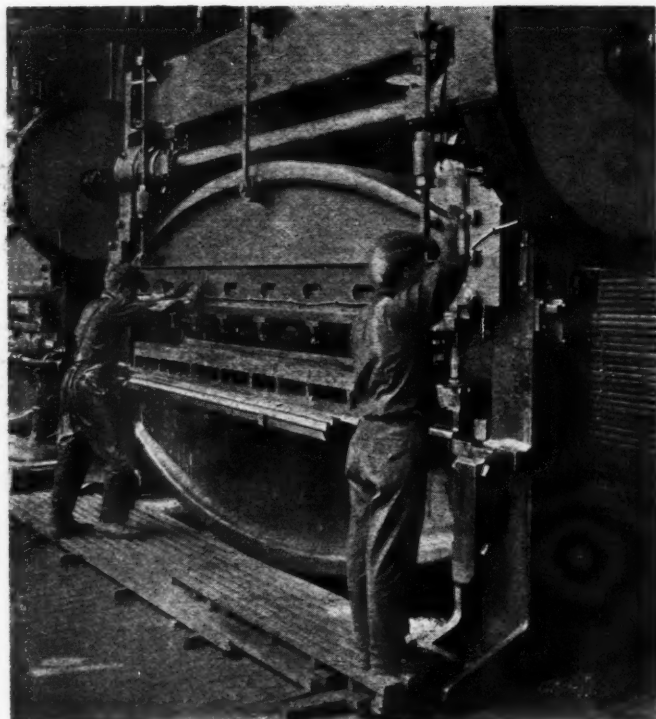


Fig. 6—Electric release on rail piercing press. All hands, front and rear of press, must be on buttons before operator can tip the press. A light shows in front of the operator as circuit is completed

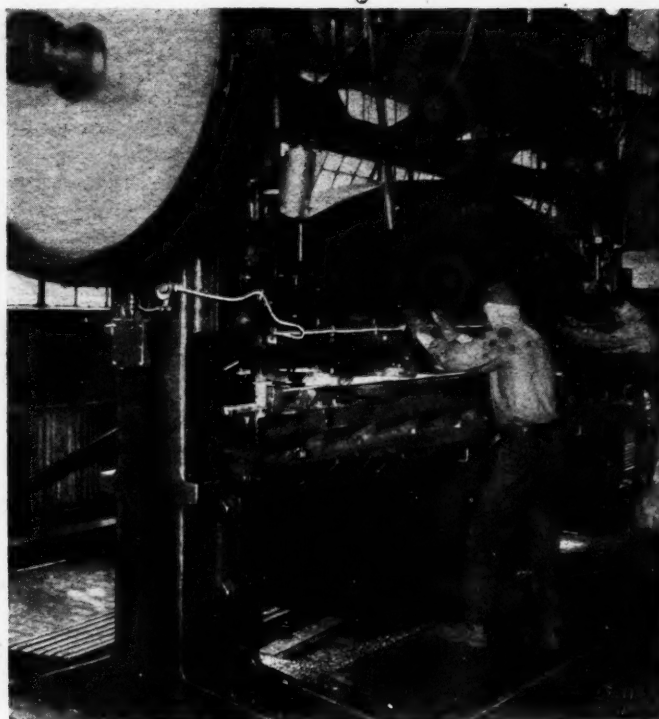


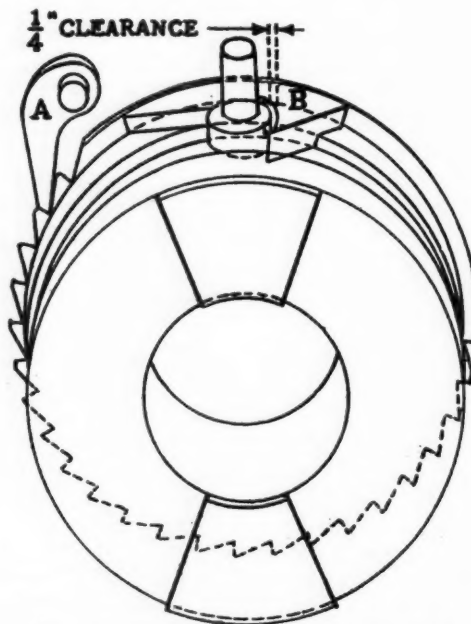
Fig. 7—Rear view of rail press, showing "hands up," ready for die to descend

with an electric lock and small light at clutch handle, with push buttons so arranged that each man must press two before the clutch unlocks and light flashes which tells the operator that all hands are out of danger. He then pulls the lever which releases the clutch. Figs. 6 and 7 show the front and rear views respectively.

This electric button combined with a non-repeat attachment in a modified form has been used to good advantage on other and smaller presses. Experiments are now being conducted to use electricity in releasing air which in turn trips the press. This has some very good features and is an important item in reducing fatigue.

On the sliding block clutch type of presses, a valuable device to prevent the ram from going over or dropping back as it returns to position by reason of the brakes loosening, is the ratchet and dog shown in Fig. 8. The cut and description show its construction and function. All presses of this type can be equipped with this device.

Other devices made to prevent this trouble do not arrest the heavy ram and dies in time and consequently are unable to withstand the shock as the die dropped. With the ratchet and dog, the movement of the ram is followed up so closely that if the ram drops prematurely



The above sketch shows a safety attachment which has been designed and applied to several of our punch presses by the Safety Engineers of this department. Notches are cut in the flanges of clutch and a lathe (A) which is suspended from a pin secured to the housing of the machine engages in them. This prevents the crank shaft from dropping back should the clutch become disengaged at any time while the crosshead is going up or while on the top center. The knockout cam (B) has been made as shown in sketch so that should the crankshaft start to revolve ahead it would come in contact with the knockout pin which would also stop the cross-head from dropping down. The cam (B) should be made so as to have $\frac{1}{4}$ inch clearance between the (C&D) cam (B) and knockout pin when the crankshaft comes to a stop on the top center.

Fig. 8—Ratchet and dog safety attachment. (Description attached)

through failure of the brakes, the dog engaged at the first backward movement and stops the descent. This device performs a two-fold function, preventing the die from dropping either forward or back prematurely.

As the stock of safety equipment in a plant increases it may be necessary to have an expert on power presses located in easy access to each department; this expert can make certain that the devices are used where they are designed to be used. He may caution and instruct the new men as well.

The only difference between an unsafe job and a safe one is, oftentimes, a matter of proper instruction to the operator. Frequently a job can be set up on an automatic press in such a way as to eliminate all danger to the employee.

The difficulty usually encountered in installing the safety devices is that the piece work operator believes that they will curtail production and in this way affect wages. If this question is solved there is no trouble.

As a number of the devices illustrated or described herein were designed and constructed at the Willys-Overland Co., the writer will be pleased to answer any questions or give a more detailed description to any one further interested in these safety devices.

Improved Method of Machining Transmission Gears

Eleven operations are included in the improved method of machining automobile transmission gears which is described in this article. Great care must be taken to face the ends true with the broached holes, or the gear cutter will not be able to do accurate work afterwards.

IN machining the gears of automobile transmissions the greatest care must be taken to face the ends true with the broached holes, for otherwise it will be impossible to do accurate work in the gear cutter, owing to springing of the arbor from clamping on untrue surfaces. In the following is described a method of machining these gears which is designed both to insure the required accuracy and to reduce the cost of production.

The first operation consists in chucking, drilling the hole and facing one hub. This is done by some manufacturers in a heavy-duty drill press, drilling and facing only, without reaming. The broaches are depended upon finishing both the large diameter and the small diameter of the splined hole to size. If this results, after broaching, in a nicely finished hole, accurate within the required limits, and true enough so that when mounted on an accurate splined arbor the faced hub does not run

out more than 0.003 or 0.004 in., this is all that is necessary. If the required accuracy cannot be obtained by this simple means, the following operation is recommended after drilling, omitting the facing in the first operation.

Fig. 1 shows a special tool set-up for a Hartness double spindle flat turret lathe. The gear is held in an air chuck. Tool A is a boring bar, piloted in the chuck. B is a double ended rough-boring blade, and C a single ended finish boring cutter. Tool D faces the hub. A pull on the lever brings the second tool position into line with the work. This carries a floating reamer E. Tool F finish-faces the hub. This operation is very rapid, as most of the movements are feeding movements; there is no turret to turn, and all idle motions are light and quickly handled. Two pieces are finished at once.

The third operation consists in rough-broaching. Care

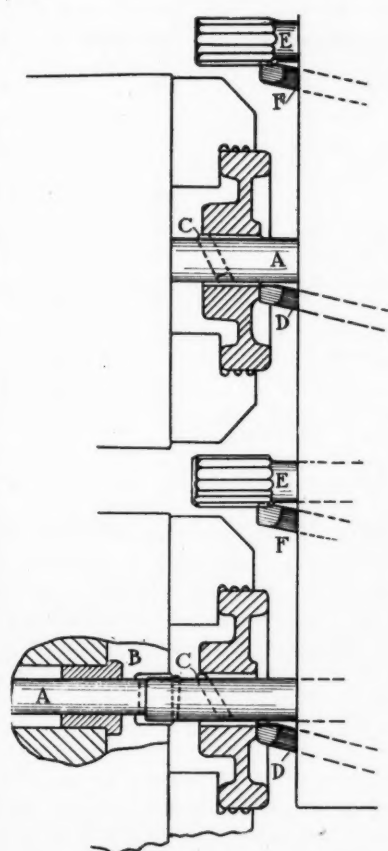


Fig. 1

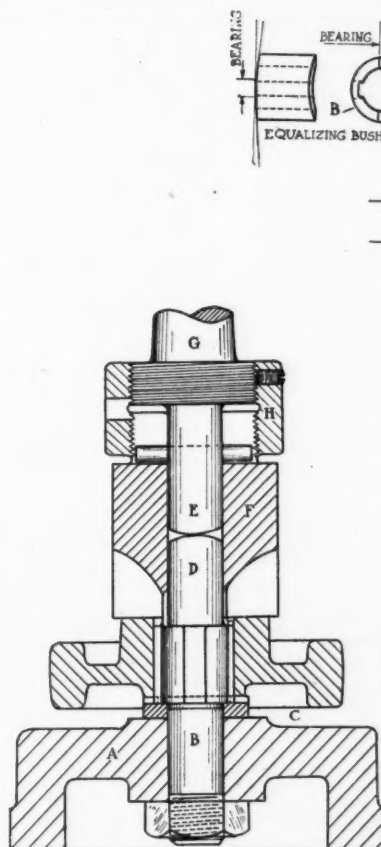


Fig. 2

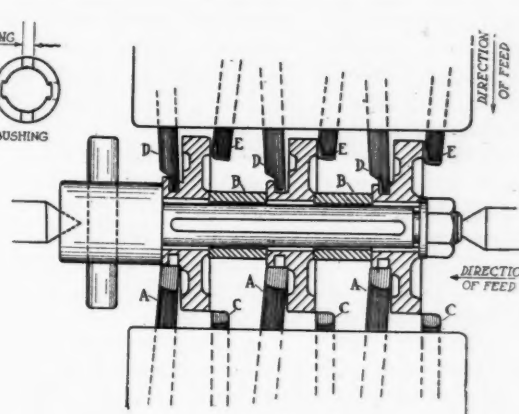


Fig. 3

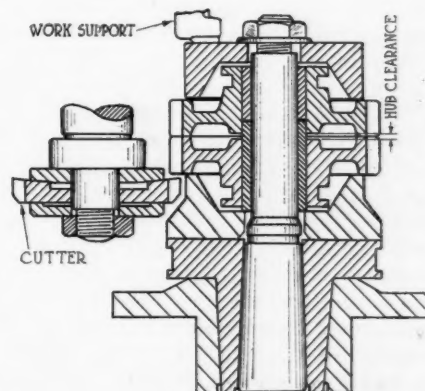


Fig. 4

must be taken that the finished hub has a good bearing on a hardened plate, and that this plate is square with the line of travel of the broach. This means occasional attention to the guides of the machine as well. In the finish-broaching, which follows, particular attention must be given to the hardened plates and guides.

The fourth operation consists in roughing and finish-butt-facing the unfinished hub in a heavy-duty two-spindle drill press, as shown in Fig. 2. A is a sliding fixture which may be moved from the roughing to the finishing spindle. It carries a stud B, milled and ground on its large diameter to be a close, but free splined hole of the work when made to the minimum tolerance. C is a hardened washer on which the work seats. The upper end of B forms a hardened and ground pilot D, which seats in the ground bore of the butt mill F. This mill is centered on the hardened and ground pilot E of the tool shank G. It is driven by a cross pin, and adjusted for depth of cut by the right and left hand threaded collar H.

The depth of cut is determined by stopping against the spherical hardened ends of pilots E and D. This gives a very accurate hub length, which cannot be obtained when the spindle is stopped against a collar on the spindle bearing, giving an error resulting from the elasticity of the whole machine structure. This accuracy of hub length makes it possible to put more than one blank on an arbor in the succeeding lathe operations.

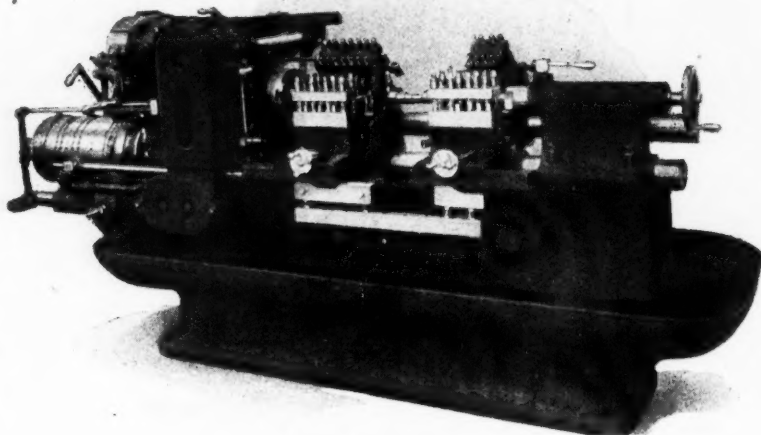
The result of the work has been so far to finish the hole ready for hardening and grinding, and to provide finished hubs which do not run out in extreme cases more than 0.003 or 0.004 in. with the hole.

Rough turning, grooving, and rough facing both sides of the rim in the Fay automatic lathe, three at a time on one arbor, as shown in Fig. 3, constitutes the fourth operation. This is for work of the usual proportions. Where the splined hole is unusually small, it will be best to do two at a time only. The principal point of interest in this operation is the equalizing bushings B, which permit the three gears to be clamped up on the arbor without springing it, even if the hubs run out slightly. These bushings have a narrow cross bearing on each end, at right angles to each other, and are a loose fit in hole and spline. The bushings adjust themselves to fit the face at each end and put no cramping strain on the arbor. This device eliminates the separate engine lathe operation often employed to true the hubs with the hole.

The front carriage has a compound motion. Tools A first feed in toward the center, facing one side of the rim and forming the hub. When they have completed this cut, the carriage feeds toward the headstock, while tools C turn the outside diameter. In the meantime tools D in the rear tool holder have been following down behind tools A, and start roughing the groove immediately on the completion of the facing feed of the front carriage. Tools E at the same time face the other side of the rim.

In the sixth operation the blank is finish-turned all over in the Fay automatic lathe, using the set-up shown in Fig. 3, the same as for roughing. Since the face of the rim on the hub side sets back of the adjacent face of the groove, tools D in this operation clear the side of the rim and start in the finish grooving at once. They thus are able to take the full time of the operation in getting a good finish on the groove with a fine feed.

Chamfering the corners of the gears is usually done in the tooth rounding machine. If required, however, it can be accomplished without decrease of output by inserting extra tools in the set-up shown in Fig. 3 for the finish operation.



Fay automatic lathe

As compared with other known means of turning gear blanks, these two operations on the Fay automatic lathe offer the advantages that turning and facing cuts are taken simultaneously, that roughing and finishing cuts are taken simultaneously, one man operating the two machines, and that three blanks are being operated on simultaneously on each arbor in each machine.

The seventh operation consists in cutting the teeth. This may be done in any machine preferred by the manufacturer, but in any case the gears should be clamped on the rims and not on the hubs. Fig. 4 shows this method applied to the Fellows gear shaper.

One advantage of this method is that it avoids the necessity for a separate hub facing operation on the engine lathe. These hubs are not dead accurate with the hole, and clamping two blanks together on untrue hubs will spring the arbors and the cut teeth will run untrue. In the second place, the rim is the best place to clamp anyway. By supporting the work right up to full cutting diameter, heavier feeds may be used in the gear cutting, and greater accuracy obtained at the same time.

Next follows the chamfering of the teeth in a corner-rounding machine as the eighth operation, and the removal of all burrs as the ninth. The tenth consists of carbonizing, heat-treating, removing scale, etc. In the eleventh the hole is finished on an internal grinder, the gear being chucked on the bottom diameter of the teeth and drawn back against the face of the gear rim—not against the hub. This will give a finished hole true with the teeth, which is the final requirement for a quiet running transmission gear.

Steel for Ball-Bearing Cones

THE quality and size of the cone usually determine the grade of steel used. One steel maker recommends chrome steel, as chromium refines the grain, gives a denser structure and intensifies the sensitiveness of the metal to quenching. For cones, a carbon content of .95 per cent to 1.15 per cent is generally designated. Opinions, however, differ as to the proper chromium content, some users specifying approximately 1.50 per cent, while others are satisfied with .40 per cent. In some instances a straight carbon steel is used. Cones must have great hardness to withstand the loads and offer resistance to abrasion. Clean steel is absolutely necessary in their manufacture and careful annealing is highly essential to get the desired machining qualities.

Is "Welfare Work" Accomplishing Constructive Results?

It is not always sensible to do unto others as you would think that they should do unto you. What Smith desires you to do to him may not be at all what you desire Smith to do to you. This fault, together with other ones, is discussed in the following analysis of the value of "welfare work."

By Norman G. Shidle

IF a friend came into your plant, said he was interested in industrial relations, and would appreciate learning something of your experience and methods in that connection, along what lines would you begin to discuss the matter? What phases of your personnel work would first occur to you?

Interviews with over a hundred executives in the automotive industry—some high up in their organization, some in less important positions—indicate a strong tendency to turn first to what is unfortunately known generally as "welfare work." A question in regard to industrial relations will bring a reply, in 75 out of 100 cases, regarding a band, a picnic, a baseball team, a soccer team, or some other one of the numerous activities which are broadly classified as "welfare" or employees' service work.

Sometimes the reference will be to activities that are present in the plant; sometimes to the fact that they are not present because the firm does not believe in such things. The executive of the plant that does "go in for 'welfare' work" usually speaks enthusiastically of the scope of such activities, the great benefit they are to both employer and employee, and how greatly they are appreciated by the workmen. In a majority of plants where such work is extensively carried on the executives seem to regard it as by far the most important phase of industrial relations; certainly they talked most of it.

In those plants where such activities are in disfavor, the general opinion seemed to be that since no "welfare work" was being done, there really wasn't anything to be said in connection with industrial relations or personnel methods. Briefly, an analysis of the opinions expressed by this large number of executives reveals the fact that, to the minds of the majority, "welfare work" and industrial relations are synonymous and co-ordinate terms; if one wishes to write about industrial relations, he is, *of course, interested* in writing about "welfare" work. This obsession is especially prevalent in publicity departments.

Since this conception is so wide-spread, a clearer and more analytical discussion of its fallacy is needed. It will be of value to determine in a general way what the real function of "welfare" or employees' service work is, what are the chief mistakes most common in its operation, and what is its legitimate part in meeting the broader problem of industrial relations.

It is difficult to define the broad conception of industrial relations. Perhaps, in a general way, the problem of industrial relations may be defined as embracing a careful study of all those factors, social and individual, mental, physical and psychological, which enter into the human relationships between the workman and the industry of which he is a part; as embracing, too, an intelligent in-

terpretation of the result of this study with a view to increasing production per man, to making the employee work because of interest and desires as well as because of financial necessity. It embodies, as well, making the worker a fully developed human being, capable of doing a willingly-achieved constructive task.

This is a long, academic definition; it is difficult to render any definition that will fully meet the requirements of accuracy. Certainly, catch words and popular phrases have been used in defining it too often. With all its faults of heaviness, the foregoing definition serves at least to indicate in a general way the broad scope of the problem of industrial relations. "Welfare work" can, obviously, cover only a small part of that scope. Some executives have seen so many evils connected with "welfare work" that they disapprove of it altogether, and believe that it has no place at all in the scheme of things. Has it?

Only a discussion of current methods and practices, together with the results attained, will determine the proper answer to this question; an important question because so wide a misconception of the function and importance of this type of work is current in many parts of the automotive industry.

The most common difficulty with employees' service work as now conducted is the attempt to use it as a substitute for the more fundamental demands of industrial justice. This is true to a greater degree in some plants than in others, but it is true to some extent of the majority of plants.

To illustrate this point, one of the more glaring examples may be cited. About 5000 men are employed in this plant. Extensive service work is carried on under the supervision of the employment department; the activities include baseball teams, bowling teams, etc., financed and uniformed at the expense of the company. While the writer has no way of estimating the amount of money spent by this concern for their "welfare" activities, the sum certainly mounts so high as to call for definite returns in the way of reduced turnover and increased production if the expenditure is to be justified on practical business grounds.

As a matter of fact the chief results have included an extensive strike, an average labor turnover 10 per cent higher than the average for the city in which the plant is located, and what the employment manager characterized recently as "a general unrest that makes men quit work frequently—something I can't put my finger on."

The following facts in connection with this plant might serve some investigators in an attempt to "put their finger on the difficulty." The plant is an old one, ill-adapted to the production needs of the concern; it is dark, unsafe in

many particulars, and full of inefficient production methods; it runs night and day, operating on two shifts. "The night shift works twelve hours, from 6 p. m. to 6 a. m., while the day shift gets paid for all the overtime it works over eight-and-one-half hours;" the employment manager feels that the practice of cutting piece rates when a man has attained a certain earning standard causes great dissatisfaction, but since he has no close connection with the time-study and rate-setting department he can't do anything about it.

Money spent on "welfare work" in an attempt to make satisfied workmen when other conditions such as this prevail is as effective as an attempt to bribe William Jennings Bryan to run for President on a "wet" platform. The method described consists fundamentally of an attempt to use service work as a substitute for the more important and more practical concerns of industrial justice. It is failing to accomplish its purpose, as it always has failed under similar conditions in the past. And yet the same attempt is being carried on in modified forms in more than one automotive plant today.

After visiting the plant referred to above, the writer made the following entry in his notebook, "The employment manager has a good view of his work and the possibilities for its development, but, as in many other places, the management does not seem to be 'sold' on many of the policies which he knows would better labor conditions, reduce turnover, and increase production."

The necessity of taking from service work the curse of "charity" is generally recognized. Every firm emphasizes the fact that the activities conducted for the benefit of their employees is not charity in any sense of the word. This conception is excellent, but some employers are, unfortunately, fooling themselves in believing that they have put the idea across successfully to their workmen. For in many cases where the statement is made, it is not really true. It is charity, but the employer knows that the work will not be successful if the employees regard it in that light, and so attempts to get over the difficulty by simply saying emphatically that it is not charity. In these cases, no special harm is done to the employees, but the manufacturer is not doing himself justice. If he honestly desires to have his service work upon a clear-cut man-to-man basis, without any suspicion of charity, he must investigate the way in which that work is now being carried on and make any changes necessary to put it on that basis. Emphatic speech and reiterated statements will not change the facts. In the matter of service work, it is always well for the employer to be absolutely on the level with himself.

The chief executives of an organization cannot depend too largely upon the administrative ability of the man in charge of service work unless they are willing to employ a man for that task in whom they can repose confidence in large as well as small things. Some firms have personnel managers who are thoroughly capable of working out the labor problem of the organization in a progressive and constructive manner, but their position and power in organization councils is so small that they can never succeed because their activities are too much circumscribed where any important or vital decision is involved.

The man in charge of personnel work should be capable of taking his place in the highest councils of the

firm; otherwise the results of his activities are liable to be liabilities rather than assets. There are many such men acting as employment managers in automotive firms who are not being given sufficient scope to properly perform the broader functions of their position. The best plan is to get a personnel manager on whose judgment you can rely in large as well as small matters pertaining to his particular line of work; then rely on it, just as you rely upon the judgment of the production manager in regard to those things in which he is a specialist.

There is a distinct danger in standardization of methods in personnel work. Service work in particular is too often organized and administered according to the employer's idea of what the workmen should want than according to what they really do want. The ultimate purpose of service work is to increase production and reduce turnover. If the men do not in their hearts thoroughly appreciate and approve of the work as conducted in their plant, that work has failed in proportion as it lacks that approval. This is simply a bare fact. Whether or not they ought to approve is not material; the employer can prove them unreasonable, foolish, and what not, but the fact remains that the work fails.

The president of a concern in Michigan has a rather sensible method of installing any new feature of service work in his plant. His organization is a small one, which renders his method particularly adaptable. Suppose, for instance, that he believes it would be a good thing to have a plant baseball team. Baseball is the national game, every one is interested in it, it is healthful exercise for the players and wholesome amusement for the onlookers. There is every reason why a baseball team should

be an excellent feature in his service work. Instead of calling a mass meeting, stating his plan, its advantages, his promises of financial help, etc., as is usual, he adopts a different method.

This president, in one of his frequent trips through the shop, stops for a moment to chat with some old employee with whom he is on friendly terms, and whom he knows is well-liked by the other workmen. "Pete," he might say, "it seems to me the boys would like to have a ball team here at the plant. Suppose you talk it over with a few of them, and if they seem interested, tell them to come up to my office and I'll be glad to help the thing along." That is all. A few days later, Pete reports to the president that he has talked to a good many of the boys and finds that none of them care about baseball for one reason or another, and that they really wouldn't be interested in a team. That is the end of the matter.

If on the other hand, the reaction had been favorable, the men would have organized the team themselves and simply been assured of help from the company. A brief study of this method shows that it goes to the heart of this particular problem. The details might not fit in every plant, but the idea is capable of general application. Much money is being spent to-day for service activities which, if they do no harm, do practically no good, because enthusiasm for the activity must constantly be fostered and manufactured.

The vice-president of a large New York automotive concern, an exceptionally keen observer of men and business,

THE "welfare" department should be called upon to justify its existence just as definitely as any production department. Much money is being wasted in such activity, the results attained should be analyzed and audited. Whether a department deals with human relationships or nuts and bolts, it should be able to render an account of constructive results. Money should not be poured into a "welfare" department on general principles in the hope that some good may come out of it.

recently voiced a few critical suspicions of the extensive "welfare" work being carried on within his own factory. In connection with the idea referred to in the preceding paragraph he said, "After some rather careful investigation and analysis I have very nearly come to the conclusion that much of the time of our 'welfare' directors is taken up with devising and promoting activities, the chief purpose of which is to give themselves something to do and thus provide a job for themselves. Many of our 'welfare' activities are participated in by only a few men, while the majority fail to react to them at all. I think we are absolutely wasting a great deal of our money." This opinion was expressed by a man who has the most thorough sympathy with the aims and aspirations of the workmen.

And in this connection, it is undoubtedly true that service work, more than any other phase of personnel management, is likely to lack a definite purpose; a definite aim; a definite objective. During the war, a young man of twenty-two was put in charge of this phase of work at a shipyard employing ten thousand men. He knew from slight experience and considerable reading, the various activities which should comprise the standard "welfare" program. Without a financial appropriation and with little co-operation from the head of his department, he started in to develop as many of those activities as possible. He liked to work and was energetic; the more activities, the more work, and the more credit to be received.

Some activities for which there was a spontaneous demand, he developed successfully without a financial appropriation. Others he struggled hard to develop, got started, helped totter along for a time, and finally had to drop. And he was disappointed when he had to drop them. He did these things because he was being paid a salary, was conscientious, and felt that the more things he could develop and arouse an interest in, the better he was serving his employer. But he thought of the activities and then tried to develop them, instead of seeking from among the men a demand and then aiding them in developing the things in which there was a spontaneous interest. The experiment was not a costly one because no finances had been put at the young man's disposal. In most cases, however, an appropriation is put in the hands of the "welfare" director, and often, with the best of intentions, that director wastes many dollars in vigorous expenditure of misdirected energy.

Service activities need to be planned with more directness of purpose and definiteness of result than is common. The activities that furnish material for the most striking publicity stories are, in actual practice, rarely those which are doing the most effective work. Service activities should be more definitely directed toward practical results in the field of industrial relations, and less toward developing material for house organ and publicity stories.

In many instances a lack of correlation between the service work and other kindred activities is rendering ineffective otherwise well conducted activities. The lack of objective apparent in service work may frequently be traced to this fault. Fundamentally the chief executives of an organization are responsible for shaping the aims and purposes of service work, because this part of the

personnel activities cannot function in its most effective way as a segregated unit. If it is to be really useful it must operate as an integral part of the employment or labor department; that is its activities must be correlated, not merely in a general way, but in definite organization with the other factors in the plants dealing with and affecting human relations. One plant, an extreme example, has an employment department which handles service work as well as employment, while it has also a labor department which interviews outgoing men and reports some numbers but no little information to the employment department. There is no routine organization connection between these two departments; they can co-operate in the matter of exchanging information and data in so far as the heads of the two departments see fit; just as the heads of any two departments of a plant may co-operate. Neither department, of course, can function effectively under this system any more than the paymaster's department could function effectively if it had only a casual connection with the time-keeping department.

The proper place of service work in many plants is not clearly defined; the work has been installed without any clear idea as to its ultimate purpose or the direction of its policy, and like Topsy it "just grows." This fault is common, but can easily be eradicated through a little careful study and departmental reorganization.

Finally, a fundamental fault frequently appears; a fault suggested by the introductory paragraphs of this article. It is the logical outcome of the tendency among executives to immediately recur to service work upon the mention of the subject of industrial relations. Service work is too often used as the beginning of an industrial relations policy in a plant.

Many organizations may be

found with well-developed service activities, while the basic matters which really influence human relationships have been left unstudied and uncared for. Service activities do not form a firm foundation upon which to base an industrial relations policy. They touch chiefly upon the lighter and less important phases of human relationships; these phases may be important in their effect upon the more material and necessary phases, but those more necessary needs cannot be met on a basis of the lighter ones. A windshield is almost a necessity to the present day passenger car. Yet no manufacturer would think of equipping a car with a windshield, leaving out the motor, and then expecting the car to run along for some time until the motor could conveniently be installed.

Yet the situation is analogous. A recent article in AUTOMOTIVE INDUSTRIES commenting on the work of the labor department at a big rubber company said: "All this (the 'welfare' work) has a definite effect upon the morale and upon the quality of workmanship, but the labor division is emphatic on one point. 'Welfare' work is effective only as it is superimposed upon other things of a more fundamental nature." Briefly such activities may be compared more accurately with the icing on a cake than with the body comprising the main constituents.

Service work in the past has suffered chiefly from overemphasis. Far too much importance has been given to it in the general outlining of an industrial relations policy.

(Continued on page 629)

PRACTICALLY every automobile plant is properly equipped with decent working conditions, sanitary wash rooms and toilets, medical aid, and similar necessary aids to production efficiency. These things are not included in the term "welfare" work; they are necessities. "Welfare" for employees' service work comprises other activities conducted by the management for the ostensible purpose of rendering life more pleasant and work more attractive for the employees. It is the latter activities which are the subject of this discussion; the former should be taken for granted in every factory.

Four-Cylinder Bugatti Wins French Light Car Race

Over a rough course, only seven out of twenty-one starters finished race. Twelve cars dropped out because of mechanical failures; others outside time limit. Bignan-Sport cars took second and third places. Bugatti entries show remarkable ability to hold to road at high speed.

ERNST FRIEDRICH, driving a four-cylinder Bugatti of only 2.5 x 3.9 in. bore and stroke, won the French international light car race with an average speed of 57.13 m.p.h. for a distance of 255 miles. This event, held on Sept. 2, is the only road race to be held in France this year. It was organized by the Automobile Club of Le Mans for machines having a piston displacement of not more than 85 cu. in. and a maximum weight of 1100 lb.

The race was held in the immediate neighborhood of Le Mans, the grand stands being erected on the site of one of the biggest American Army camps, vestiges of which still remain. By reason of American Army activities around Le Mans all the roads are in poor condition, and to get the best possible course the club selected a circuit only a little more than 10 miles around. This was repaired as far as possible and treated with calcium chloride. While the roads were very straight, the surface was rough and the width was not great. This combination made high speeds impossible and the rough surface proved destructive to the competing machines.

There were twenty-one starters in the light car race, the competitors being sent away in pairs at half-minute intervals. Only seven machines finished; twelve were put out by reason of mechanical failures, one was disqualified, and one abandoned when its driver found that it was impossible to finish within the time limit. Viscaya, on No. 1 Bugatti, made the fastest initial lap, at an average of 61½ m.p.h. He was closely followed by his teammate, Friedrich, who eventually proved to be the winner, and by Violet on a Major cyclecar of 67 cu. in. piston displacement. This machine had run the previous day in a cyclecar race over the same course, and had won that event. Its high speed in the light car race made a great impression, and the daring of its driver appealed to the crowd. The Major has a twin-cylinder two-stroke engine, with crankcase compression but without deflector. The two cylinders have a common combustion chamber, and intake is by means of one cylinder and exhaust by the other.

Although the quality of the machines in the race was

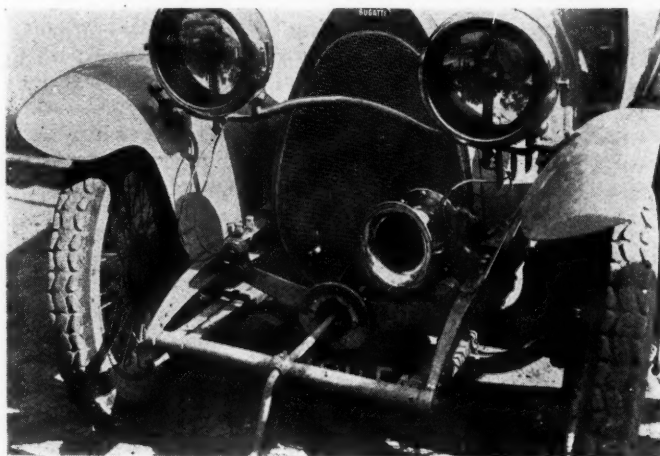
very high, mechanical troubles began at a rather early hour. Albert Guyot and his teammate Honol both went out after a couple of laps with broken steering gears on their Sizaire-Naudin machines. Colomb, on a La Licorne, estimated to be one of the fastest, was held up with a burnt clutch leather. A temporary repair was made, but this did not hold and the machine was withdrawn early. The Bignan-Sport team lost De Courcelles at quarter distance by reason of magneto failure. Of the Majola four, Carteau went out with valve trouble, Leduc broke a connecting rod, and Muraour retired with a hole in the crankcase.

England was represented in the race by three Silver Hawk light cars, one of which was driven by Rene Thomas. These cars were afflicted with a thermo-siphon cooling system which proved insufficient under constant hard running. Pickering, one of the drivers, poured cold water into a hot engine and cracked the water jacket. Thomas stopped at half the distance for water, but a crack having developed in the water inlet pipe soon after this, he was obliged to stop for every one of the last ten laps in order to take on water. He finished the

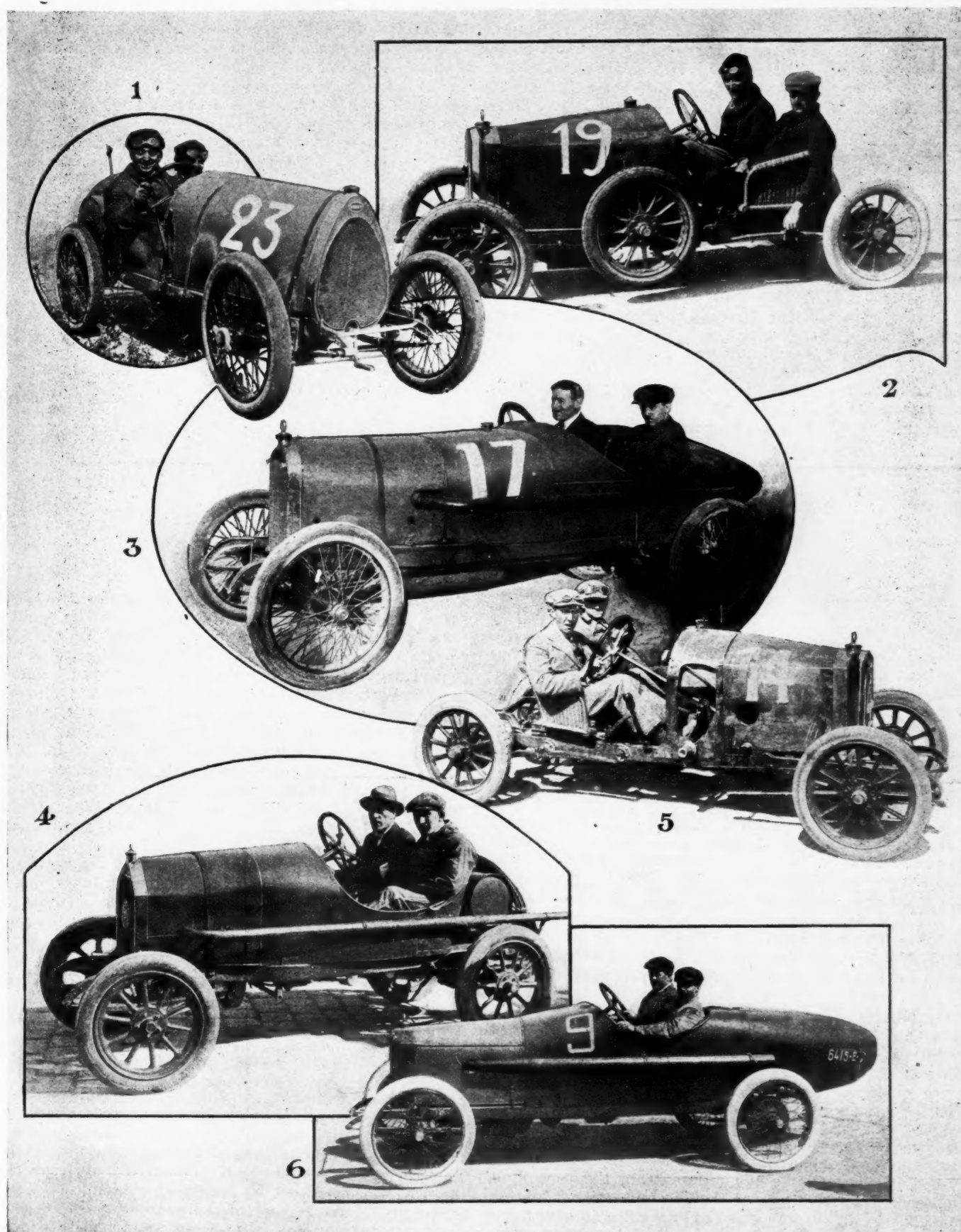
race, but in comparatively slow time.

At half distance the race looked like a complete victory for Bugatti, for these cars were first, second and third, the leader having an advance of seven minutes on the fourth man, Nougé on a Bignan-Sport. There were twelve machines in the race at this time, but soon afterward the Englishman Marshall, on a French Mathis, had to withdraw owing to a broken magneto drive, and Violet after making a fine display went out with broken chain and leaking radiator.

Four laps from the end, when Friedrich was in the lead, with Viscaya second and the third place very keenly fought for by two Bignan-Sport cars, No. 1 Bugatti came in for oil. Just as the car was moving off Mr. Bugatti appeared to detect some sign of overheating, for he shouted to Viscaya to stop, ran after the car and began to unscrew the radiator filler cap. Without a moment's hesitation the jury disqualified the car and gave orders that it should not be timed. This decision was strongly disapproved by



A new Bugatti with double semi-elliptic springs having two inverted leaves above the main leaf and a central friction type shock absorber



(1) Ernst Friedrich on Bugatti which won French light car race. (2) De Courcelles on Bignan-Sport 84 cubic inch racer with basketwork body. (3) LeDuc on Majola light car. (4) Marshall on Mathis machine built at Strasbourg. (5) Delaunay on Bignan-Sport racing machine with cantilever springs and front wheel brakes. (6) Colombe on La Licorne racing machine

the spectators, who had greatly admired the way in which the Bugatti had been handled in the race. In announcing this disqualification, the jury acted strictly according to the letter of the law, which states that all mechanical work must be done by the driver and his mechanic. They appeared to have overlooked the fact, however, that Mr. Bugatti, after having touched his car, had the right to take the place of either the driver or the mechanic. He was not given this option, for the car was ruled out instantly and without appeal. A similar case occurred in 1913 when an outsider cranked a Delage which could not be started up by Ballot or his mechanic, and then, in order to comply with the rules, took the place of the appointed mechanic for the rest of the race. Viscaya started out while the officials and the team manager were discussing, but when he came round to the grand stands again he was flagged off the course. The driver was cheered and the officials hooted.

During this incident Braccoli, of the Bugatti team, came in for a change of plugs. In the excitement and disorganization the work was not done very quickly and the engine could not be started owing to a flooded carbureter. This delay gave the opportunity to Nougé and Delaunay, on Bignan-Sport cars, to get into second and third places, and also allowed Rost of the Majola team to pick up fourth prize, Braccoli only coming in fifth. Gedge on a Silver Hawk, and René Thomas on the same make of machine, followed in sixth and seventh positions. An English G. N. retired a short time before the end, owing to the crowd having invaded the course.

The cars finished in the following order:

1. Friedrich, Bugatti	4:27:46
Average 57.13 miles an hour.	
2. Nougé, Bignan-Sport	4:47:17
3. Delaunay, Bignan-Sport	4:48:29
4. Rost, Majola	4:51:05
5. Braccoli, Bugatti	4:56:48
6. Gedge, Silver Hawk	5:37:22
7. René Thomas, Silver Hawk	5:42:43
Viscay, Bugatti	Disqualified for receiving outside assistance
W. D. Hawkes, G. N.	Running at end
Pickering, Silver Hawk	Cracked water jacket
Guyot, Sizaire-Naudin	Broken steering gear
Louvet, Baby Peugeot	Broken valve tappet
Muraour, Majola	Broken crankcase
Colomb, La Licorne	Burned clutch leather
B. S. Marshall, Mathis	Broken magneto drive
M. Violet, Major	Leaking radiator
Dumoulin, Tic-Tac	Broken bearings
Leduc, Majola	Broken connecting rod
De Courcelles, Bignan	Magneto trouble
Honol, Sizaire-Naudin	Broken steering gear
Carteau, Majola	Valve breakages

The winning Bugatti car was built in 1914 at Mols-

heim, Alsace, then German territory. But when war appeared imminent, this and other cars were run into Italy to save them from German requisitions. Ettore Bugatti, the builder of the cars, although of Italian nationality, was obliged to leave Alsace and immediately took up the work of designing and producing airplane engines for the Allied forces. The racing cars were brought into France before the end of the war and were used for carbureter, spark plug and other experiments.

The engine used on the Bugatti cars is a four-cylinder block casting of 2.5 x 3.9 in. There are four flat-seated valves per cylinder operated by an overhead camshaft and curved rocker arms, the camshaft being operated by a vertical shaft and bevel gearing. Pistons are of aluminum, with three rings, and lubrication is under pressure. The power obtained is 29.5 at 2750 r.p.m. A Zenith carbureter is employed and ignition is by high tension magneto. On No. 1 car, which was disqualified, single plugs were used; on the two others there were two plugs per cylinder.

One of the most remarkable features of these cars is the way they held to the road at high speed. In this respect they were undoubtedly the equal of the best big racing cars ever built and were very much superior to any other machines in this race. Semi-elliptic springs were used in front and inverted quarter elliptic at the rear. The gear ratio in the rear axle was 14-45, with wheels of 710 x 90. Friedrich covered the entire distance without getting out of his seat.

The Bignan-Sport cars, which finished second and third, have four cylinders in a block casting of 2.4 x 4.68 in. The valves, with inclined stems, are on opposite sides, operated by two camshafts in the crankchamber. Steel pistons are used and lubrication is under pressure. At 3000 r.p.m. the engine is declared to develop 35 hp. and to have a practically straight power "curve" up to 3200 r.p.m. A cone clutch is used, with four-speed gear box and central drive. Cantilever springs are employed. One of the excellent features of these cars is the use of front wheel brakes, which are operated without any external joint. The pedal operates the brakes on all four wheels.

Majola had four-cylinder motors of 2.5 x 4 in., with valves in the head, operated by an overhead camshaft which received its movement from the crankshaft by means of an enclosed silent chain. The crankshaft is carried in ball bearings, steel pistons are used, and connecting rods are tubular.

The Licorne car, which was eliminated by reason of clutch trouble, has an interesting four-cylinder motor, with cylinders cast separately but mounted up close together so as to form a common water jacket for the four.

Few Entries Finished in Cyclecar and Motorcycle Races at Le Mans, France

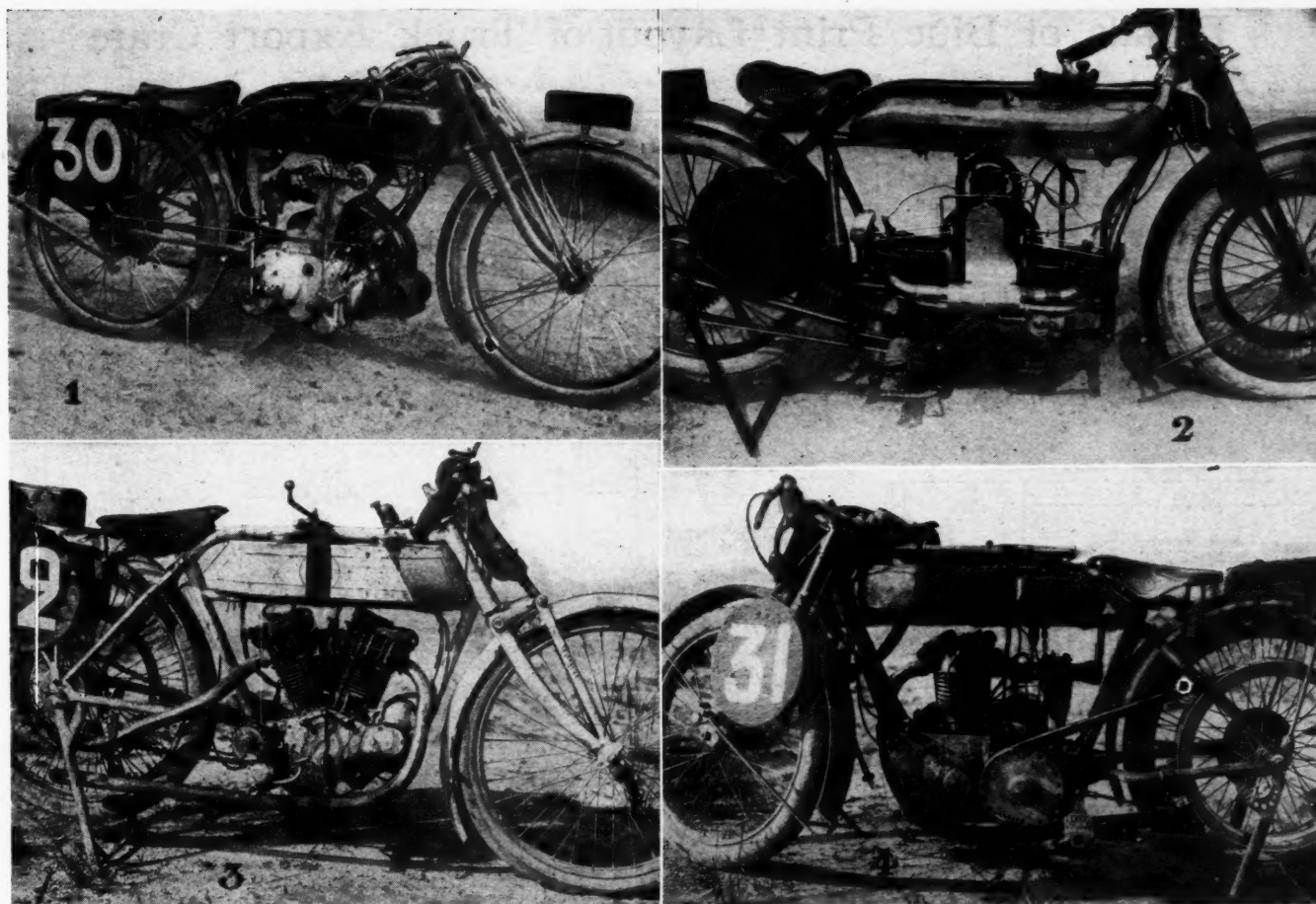
VIOLET, on a Major cyclecar equipped with a special two-stroke engine of his own design, was the winner of the French cyclecar race held at Le Mans on Sept. 2. Only three out of the fifteen machines which started succeeded in covering the 170 miles within the time limit imposed. Violet's time for the 170 miles was 3 hrs. 48 min. 27 sec., an average speed of 43.5 miles an hour.

The regulations limit the piston displacement of cyclecars to 67 cu. in., with a maximum weight of 770 lb., including body. With such regulations the machines are more on motorcycle than on car lines.

The fact that the race was won by a two-stroke engine

caused some comment, for this is the first time in a French race that the two stroke has proved superior to the four stroke. Second prize went to Leveque on a Ruby cyclecar, who finished 10½ min. behind the winner. Third prize was secured by Noel on a Noel cyclecar. All the others dropped out by reason of mechanical failure.

The distinctive feature of the winning machine is its twin cylinder vertical water-cooled engine with a common combustion chamber for the two cylinders. Bore and stroke are 2.9 by 4.7 in. Crankcase compression is employed, with a rotary, chain-driven distributor. The fresh mixture is admitted into one of the cylinders and



(1) Peugeot single-cylinder racing engine with four overhead valves piloted by a train of spur pinions in accordance with car practice. (2) New Douglas engine with aluminum cylinder detachable heads and overhead valves with automatic oil feed. (3) Detail on Alcyon twin cylinder four-valve racing motorcycle. (4) Bleriot twin-cylinder racing engine with four overhead valves per cylinder

exhausted by the other. There is a single plug and the two pistons move up and down together. The claim is made that this engine, which develops 30 hp., is as economical as a four stroke, but in the race it used nearly 12 gal. of gasoline for a distance of 170 miles.

The high percentage of failures in the race can be attributed to the inability of the machines to hold together on a fast course with rough surface. The circuit was the same over which the light car race was run, so that the same rough roads were encountered, although the highest speeds were obtainable on certain straight stretches. Even the Morgan, which is a well-trying type in England, could not stand the gaff. With the exception of the engine used by the winner, no mechanical novelty was revealed by the race.

The motorcycle Grand Prix, forming a part of the Le Mans meeting, also proved very destructive. Although the competitors were the best France and England could provide, only one machine finished in the 500 cc. class out of 17 starters. This was an Alcyon, driven by Joly, who averaged 44.1 miles an hour for the 233.75 miles. An A. B. C., built by the French Gnome Co., came in one minute after the race had been called off. All the others had to abandon by reason of mechanical breakdown. In the 350 cc. class one finished out of 7 starters, and in the 250 cc. lightweight class there were three finishers out of five starters. The percentage of failures was very much higher in the motorcycle and the cyclecar classes than among the light cars, although the latter had to run last over roads cut up by the small machines.

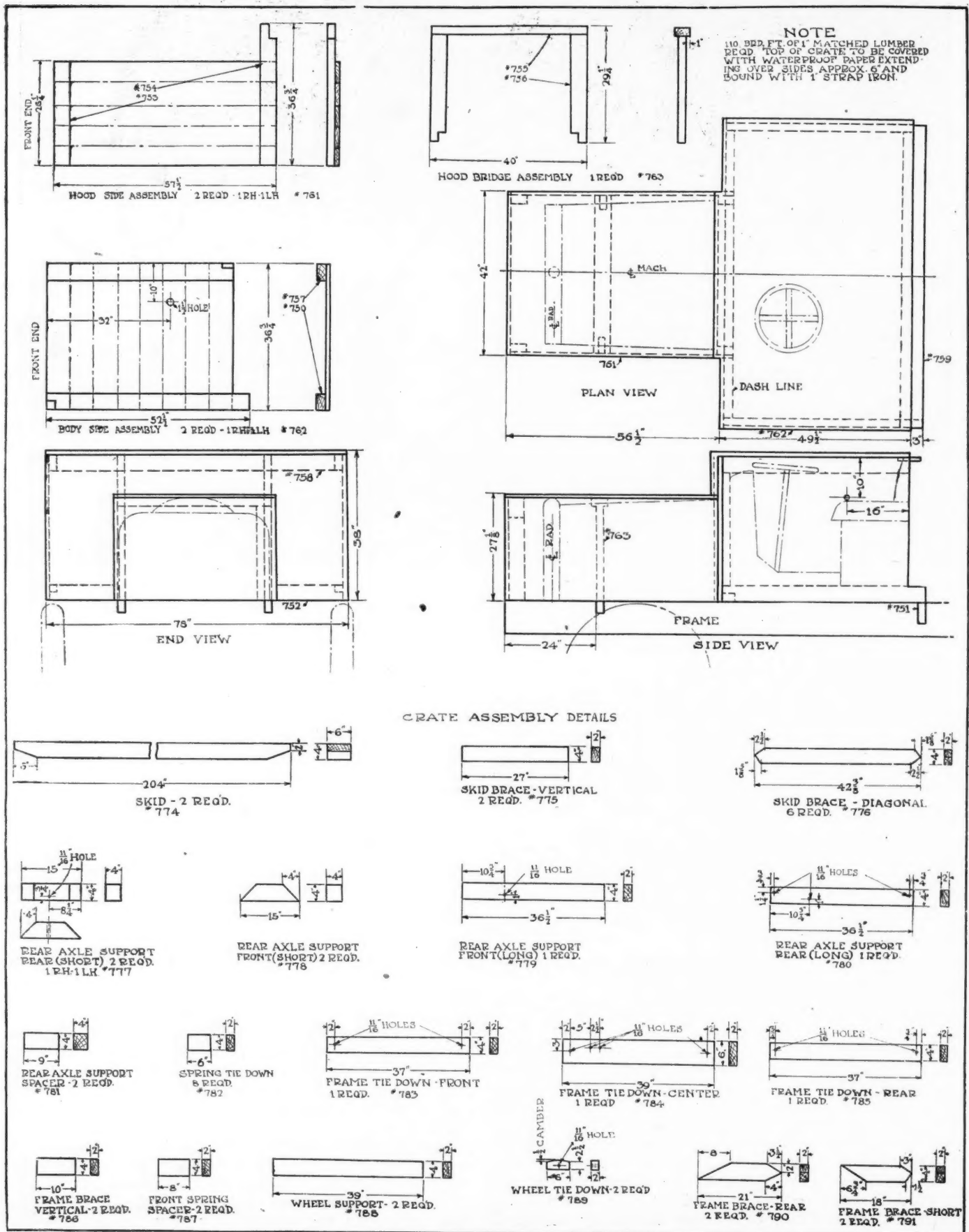
The feature of the motorcycles was the use of overhead valves, generally four being mounted in each cylinder head. The English Douglas machines had horizontal aluminum cylinders with detachable heads receiving the valves, which were operated by push rods and rockers. Oil was fed to the rockers by means of wicks from small ribbed aluminum oil tanks bolted to the cylinders. The machines had a three-speed gearset and chain drive with spring mounted sprocket. No clutch was used. Alexander, riding one of these machines, dominated the field until he stripped his second gear. It was then impossible for him to make the turns on high, and after being pushed twice, he was disqualified. The gear breakage is doubtless due to the necessity of changing gears without declutching.

Peugeot presented a single cylinder air-cooled engine with four overhead valves operated by overhead camshafts and a train of spur pinions contained in an aluminum housing on practically the same lines as Peugeot racing car practice. Transmission was by chain from engine shaft to a countershaft and by a second chain from countershaft to rear wheel. The winning Alcyon had a somewhat similar design of cylinder, with four valves and two plugs, the rocker arms being operated by push rods.

Blériot, whose standard practice is two cylinders set side by side, with side by side valves, adopted the same cylinder mounting, but had four overhead valves with push rods and overhead rockers. On this machine the two-speed gear was by means of spur gears inside the timing gear housing, final drive being by belt.

Details of Blue Print Layout of Truck Export Crate

(See succeeding pages for articles and details of larger sections)



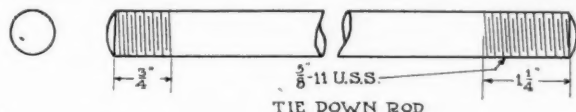
Automotive Export Crating Reduced to Blue Prints

It may seem to be a bit late for this chapter of war experience, but we believe, judging from complaints from abroad, that there continues to be a problem of export crating. Perhaps the experience of the Quartermaster Corps in solving problems may help some manufacturer.

By Eugene H. Lederer*

PROBABLY the greatest single job of exporting automobiles and trucks was the one that confronted the Q. M. C. of the U. S. Army when the American troops in France stood in need of more transport than it was physically possible to send to them.

The problem was somewhat different from that which confronts the manufacturer sending his vehicles to a customer abroad. The commercial problem has, of course, all of the elements of desire to ship properly and effectively, that the dealer shall be satisfied with the vehicle when it arrives and that he shall be able to satisfy his customers without delay, and that both the



dealer and the consumer shall continue to be customers of the shipper. But if there is failure, it will be measured in dollars and cents.

There is where the Q. M. C. problem differed. The failure in this case was measured, if it could be measured, in human life.

So it is reasonable to expect that the men charged with the shipment of the army vehicles put their best ability to devising means of quickly and effectively shipping the vehicles that were piling up at the various docks. Their first step was an analysis of the problem. It was found that there were four conditions that it was absolutely necessary to guard against and that these had been neglected in previous shipments. Complaints followed the early shipments and the following conditions were based on early complaints.

First, Failure to so pack as to guard against the losing of parts or the breakage of parts which would be very difficult to replace on the other side.

Second, Failure to so pack vehicles that they would make a compact package for storage in the holds of vessels.

Third, Failure to so prepare the vehicles that they would be protected from salt water or salt air which prevented the utilization of deck space on vessels.

Fourth, Failure to take advantage of so arranging vehicles to allow for minimum cargo space which was indeed expensive.

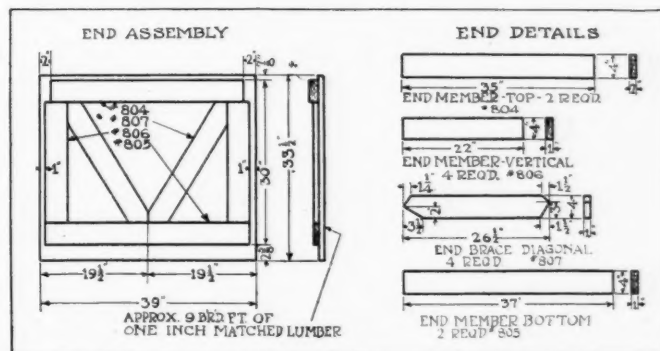
It had been found that, in time of war as well as in times of peace, that all piers are not equipped with mod-

*Late Captain, Q. M. C., U. S. Army, port supply officer, Philadelphia, now of State College Products Co.

ern machinery for the handling of large parcels. Many piers in all parts of the world have no special arrangements for the loading of vehicles. In fact, many of the older piers are not equipped with doors that are wide enough or high enough to permit the proper handling, and when an automotive vehicle is swung over the ship's side, there is not enough space in which to guide the parcel with safety, and with a jerky donkey engine doing the hoisting, one can see how easy it is to damage the vehicle.

Again, there may be no warehouse space available at the loading or unloading port and the vehicle must be permitted to stand exposed to the weather for an indefinite period. This frequently happened in case of war shipments and no less frequently during strikes of pier workers since the peace-time shipments were resumed.

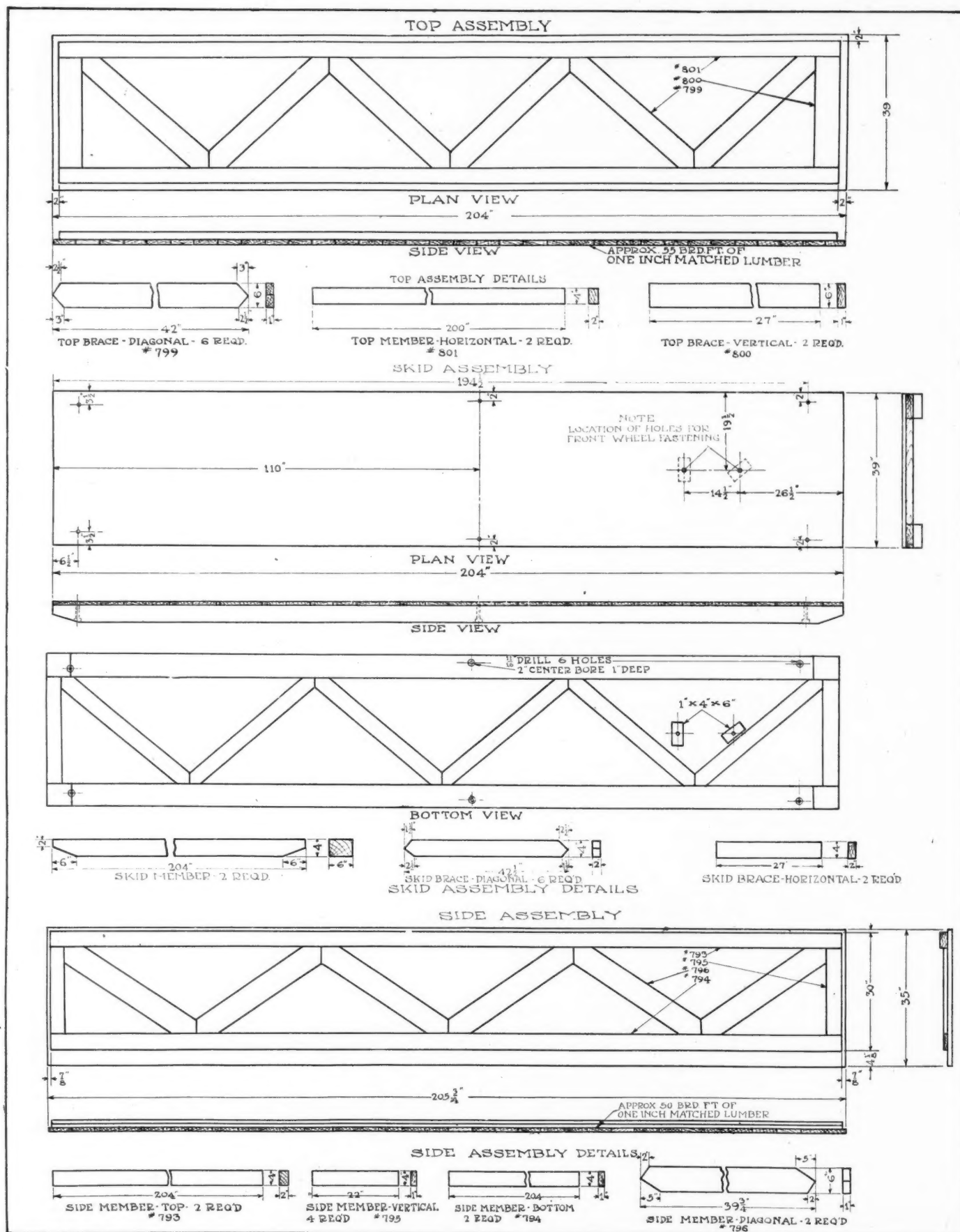
Confronted with these conditions the army officers charged with the responsibility of shipment of motor transport, solved them by reducing the subject blue prints of the crates adequate for the various sized vehicles offered. A comparison of delays and damage quickly proved to all concerned that the delay for proper crating was insignificant to the delays attendant upon

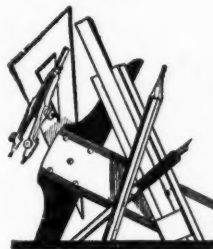


the shipping of improperly crated vehicles. The same will, without any possible doubt, hold good in commercial practice. It is an expensive bit of experience to adjust a claim for a rusted fender, a stolen carburetor, or a dented hood with the claimant in possession of the evidence at his service shop in Tasmania. One such claim often will cost as much as a half dozen crates, and then the customer is not satisfied.

Once the Quartermaster's experts had reduced their system to plain, easily read blue prints, their troubles were to a very great extent ended. These blue prints were made for all types of vehicles used by the Army. Those printed herewith were made for crating a 1 1/2-ton White truck.

Larger Sections of Truck Export Crate





The FORUM



Truck Body Building

Editor AUTOMOTIVE INDUSTRIES:

THE standardization of truck body building is becoming more urgent as the truck industry grows, not only from the body builders' standpoint, but also from the standpoint of the truck manufacturer's service and financial interest. The body builders have seen this for years, but as their position has been so comparatively small in the rapid advance of the truck industry, their voice has not been heard in the protest of the lack of uniform truck dimensions. The great aim of the vehicle manufacturer is quantity production of chassis, and only in very few cases is the body the customer will require considered, except that the desired frame length is given. In many cases truck manufacturers overstep the mark by giving a length which permits of a body being built which greatly overloads the chassis and brings poor results to the customer, because of the bad proportion of the body to the capacity of the chassis.

It is practically impossible to have a standard cab for truck chassis where in one case the engine is built under the seat and in another in front of the dash, but in the latter case, which represents the majority of truck chassis, a set of general standard dimensions for certain capacity trucks would be entirely feasible and practical. The body space, though, on either type could be standardized, and if so, the same type and size could be used on equal capacity chassis, provided body was built over the wheels and not cut out for a certain location of the rear axle.

A few body concerns are building a standard type body and cab to apply to most chassis, but the automobile industry is not helping in this matter and this body business cannot grow and keep pace with the truck supply, for it is not inviting enough to capital to try to supply bodies of standard sizes where there is no such thing as a standard chassis, and the truck body business is now in most cities simply an outgrowth of the wagon business, where there are very few duplicates required and there is no quantity production.

It would not be good business to build the large factories necessary to build large truck bodies when the small wagon builder is your chief competitor. Large factories require quantity production, and until the truck industry agree on uniform size body specifications that will fit most all trucks, it will be impractical to a large degree for body builders to carry stock bodies. The consequent tie-up in delivery of chassis is an important item to the manufacturer of trucks, as it frequently takes from six to eight weeks to produce a good specially designed body, which means the investment in the chassis is tied up and either the agent or the body builder is blocked with a large number of chassis, which by the application of a standard body would take about a week's time for delivery.

Also, the mechanical lift body is seriously handicapped by the absolute lack of standardization of the power take-off, and this not only adds greatly to the individual cost of this type of body, but requires a specially designed mechanism to connect to the power take-off, which invariably requires special castings and specially cut

gears that hold up the delivery of the completed truck very seriously. These delays are not only costly to the truck manufacturer because of the inability to turn his product into money quickly, after completion at the truck factory, but also add considerable cost to the body, which must be borne by the customer, and also reacts on the industry.

On account of the size of most truck bodies, it is in most cases impractical to mount large bodies at the truck factory and ship by freight to the customer. It is also probably undesirable from a production standpoint for the manufacturer of chassis in large quantities to bother with the mounting of special bodies at his factory, but most chassis are sold through truck agents or branches, and if a standard truck could be sent to a local body builder and there fitted with a standard body from stock, all parties interested would be greatly benefited by quick delivery to customer, and a prompt return to truck manufacturer or agent on his investment. Besides, the body builder would not only be able to sell a good article at a lower price and give better service, but would be able to conduct a larger business by building stock at times when demands on his production were not so heavy, which would thereby equalize and stabilize his working force, which would eventually make the truck body business more interesting to the investor.

In selling trucks, the salesman in most cases is only interested in the sale of the chassis and he allows the customer to select any special design of body he wants, whereas a little argument on the part of the salesman would in most cases enable him to sell a complete vehicle with standard body, which would benefit all parties concerned.

L. L. WOODWARD,

President, Fitz Gibbon & Crisp, Inc.

Newton, N. J.

Is "Welfare" Work Accomplishing Constructive Results

(Continued from page 621)

Confined to its proper sphere, administered with a thorough knowledge of its possibilities and an understanding of its limitations, service or "welfare" work may definitely aid in the development of a successful labor policy. It can never be of primary importance, however, since it deals chiefly with those phases of industrial life least related to industry and least related to the more fundamental things of social life.

Intelligence rather than money is the chief need in operating the activities in any plant. A freer application of common sense, the same demand for real results such as those required of production and engineering departments, would save thousands of dollars of misspent money. Merely cutting appropriations will not do; in many cases such an action would be the worst thing possible. The need is for an accurate analysis of past results and a careful examination of future possibilities. Make the service department justify its existence; then help it, reorganize it or abolish it.

Ignition Is Discussed by the Metropolitan Section S. A. E.

The advantages and difficulties of high compression as an aid to prompt and complete ignition are presented by head of the Power Division at McCook Field, who also discusses multipoint ignition and doped fuels. Discussion goes into the qualities of magneto and battery sparks.

By P. M. Heldt

CAPTAIN GEORGE E. A. HALLETT, who has charge of the Power Plant Division of the Air Service Research Station at McCook Field, read a paper before the S. A. E. Metropolitan Section at its first meeting after the summer recess, held at the Automobile Club of America on Thursday evening, Sept. 16.

Captain Hallett said that the ignition system includes everything from the mechanical drive of the magneto to the complete burning of the charge in the combustion chamber. Combustion of the charge starts from the point where the ignition spark occurs and spreads out in all directions somewhat like ripples spread from a stone thrown into a pond, with this difference, however, that whereas the ripples travel at uniform speed, the speed of the explosion wave increases constantly with the distance from the starting point.

The whole charge should be completely ignited when the piston starts on its down stroke, and inasmuch as a certain time is required for the ignition to spread from the spark gap to the most remote portions of combustion chamber, it is necessary to advance the ignition and cause it to take place before the crank reaches the top dead center position. Ignition then takes place and pressure begins to develop before the piston reaches the topmost point of the stroke, and as a consequence there is a reverse torque in the engine. It is, of course, desirable to reduce this reverse torque to a minimum, and this is an argument, on the one hand, for higher compression, as combustion is propagated more rapidly in a highly compressed mixture; and, on the other hand, for more than one spark plug in the combustion chamber. If the charge could be rotated in the combustion chamber so that all of it would come into the vicinity of the spark points in quick succession, the rate of combustion would be greatly accelerated, and this is an argument for turbulence.

High compression has a double value, for not only is the speed of propagation increased in proportion to the compression of the charge, but with a higher compression the combustion chamber will be smaller and the flame, therefore, does not have to travel so far.

The objection to high compression is that it leads to pre-ignition or what is often referred to as detonation. Experiments recently carried out have shown that this is seldom caused by hot valves, but quite frequently by hot spark plug terminals. A good test for pre-ignition consists in opening the switch and observing whether the engine continues to explode. If the combustion chamber is of sufficiently high temperature to ignite the charge previous to the passing of the spark, it will maintain this temperature for a short period after the spark is cut off and the engine, therefore, will continue to fire.

Captain Hallett explained the phenomenon of detonation as follows:

When the spark occurs at the spark points, the mixture begins to burn at that point and the flame spreads out from it in all directions. At the same time pressure within the combustion chamber is rapidly increasing; pressure and temperature rise together, and after a certain lapse of time the pressure will have reached a value corresponding to the temperature of self-ignition or spontaneous ignition of the gaseous mixture. Then all of the combustible mixture beyond the instantaneous front of the explosion wave will ignite spontaneously, resulting in a very sudden increase in pressure.

It has recently been found that with more than one spark plug in a cylinder, the compression pressure can be increased without causing detonation, and this is explained on the ground that with two or more simultaneous sparks, when the explosion wave has reached the point where the pressure corresponds to the spontaneous ignition temperature, there is so little combustible mixture left in the cylinder that the effect is only slight.

It has also been found in recent experiments that detonation is most pronounced in an engine of the T-head type having a hot valve (exhaust valve) on one side, and a spark plug on the other side of the cylinder. Pre-ignition can then start from two oppositely located points of the combustion chamber at the same time, and spreads very rapidly throughout the mass of the charge.

Captain Hallett said that the tendency to detonation varied considerably with different fuels, and, moreover, that the tendency could be controlled by means of certain dopes. With doped fuel, carbon in the combustion chamber becomes an asset instead of a liability, for the reason that carbon forms a heat insulator and prevents rapid loss of heat through the combustion chamber walls. In the experiments made at Dayton, with a single cylinder experimental engine of 5½ in. bore, the use of multiple spark plugs in every case resulted in a reduction in fuel consumption and also in the elimination of "pinking."

Captain Hallett said that the solution of the various problems connected with the ignition of internal combustion engines called for the co-operation of engine and ignition men, and at present there was a sad lack of co-operation. He said that in consequence of the advent of lower grade fuels, it was necessary to lower the engine compression and this made ignition more difficult. He was a strong advocate of the use of higher compression, by using doped fuel if necessary. A good spark was necessary to ignite a poor mixture, but a good spark alone was not sufficient, as its advantages might be offset by a bad location of the spark plug.

The speaker gave an outline of the tests to which spark plugs offered for use in airplane engines are submitted at McCook Field. He said that so far only three American makes of spark plugs had been found to stand up under the severe tests. He was sure that in the future higher compression would be used, possibly in consequence of the introduction of doped fuel, and he called upon spark plug makers to so improve their plugs that they would successfully withstand these higher compressions. Perhaps the smaller plugs than at present used would be better under these conditions.

An airplane engine with 18 cylinders in W-form, and developing 700 hp., which is now being built by the experimental department of the Air Service at Dayton, was shown on the screen. This engine will be fitted with a supercharger of the type developed by the General Electric Co., and it was pointed out that the spark plug working conditions are particularly difficult in an engine fitted with supercharger. The speaker mentioned the compression at which this engine would be operated, and in reply to a question as to just what he meant by the compression, said that this was the compression as measured by an Okill indicator while the engine was being motored over cold at 120 r.p.m.

Special interest was lent to the discussion by the presence of A. P. Young, a British magneto expert connected with the British Thomson-Houston Co., who has written a book on the subject of magnetos and presented several papers on it to various engineering societies. Mr. Young said that the speaker of the evening had suggested that the spark should be extended over a period corresponding to a crank motion of 40 deg., and in that he evidently favored the magneto spark because, as was generally known, the magneto spark consisted of two portions, the static or condenser discharge portion, and the follow-up or electromagnetic portion, and it was quite conceivable that at high engine speed the spark of a magneto extended over a period equal to 40 deg. of crank motion. The electromagnetic or flamy portion of the magneto spark was especially advantageous in connection with poor fuel, as mixtures of such fuels would hold small globules of unvaporized fuel in suspension, and the hot, flamy spark tended to vaporize these globules and therefore facilitate ignition.

In connection with the subject of superchargers brought up by the speaker of the evening, he would like to know how the safety spark gap, with which all magnetos are fitted, behave under these conditions. These safety spark gaps are normally set to discharge at about 9000 volts, while the spark plug discharge pressure is considerably below this. When an airplane ascends to a high altitude, without a supercharger on the engine the electrical pressure required to produce a discharge at the spark plug

terminals and that required to produce a discharge at the safety spark gap decrease in the same proportion, hence the safety spark gap continues to perform its function with the same margin of safety.

With the supercharger, on the other hand, the pressure required to break down the spark plug gap remains constant up to great altitudes, whereas the pressure required to break down the safety gap decreases with the altitude. He supposed the solution of the problem would be to enclose the safety spark gap, subjecting it to the same pressure as exists at the carbureter air intake. He would like to know how this matter worked out in the case of Major Schroeder's record altitude flight. This question was later answered by a member of the audience who stated that the ignition system of Major Schroeder's plane did not include a safety gap.

There was considerable discussion regarding the effect of multiple spark plugs in each combustion chamber. Captain Hallett mentioned some experiments with the single cylinder engine in which four spark plugs were used. Dr. Cunningham mentioned that in a low speed engine he had found no advantage from the use of two and four simultaneous sparks; in fact, he had found the power output to decrease as a result of the use of multiple sparks. It was generally agreed, however, that in high speed engines multipoint ignition is of advantage not only from the standpoint of increased power output, but also from that of fuel economy.

As regards the subject of spark plug construction, one of the speakers said that the material at present used for spark terminals, viz., 98 per cent nickel steel, was not good enough for spark plugs intended for use under difficult conditions, as in airplanes; in England they had begun to use tungsten for this purpose.

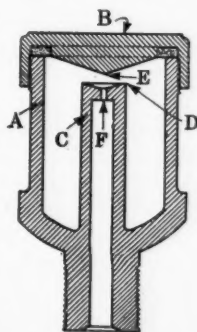
Captain Hallett was asked what were the dopes that he referred to in his paper. He replied that the General Motors Research Corp., which had been developing these dopes, was at present arranging to market the dope throughout the country. Quite a number of different dopes had been experimented with. Alcohol had the same effect, but alcohol would not mix with gasoline, and in order to make it mix it was necessary to add benzol also, but there was not enough benzol in the country to make it possible to add a sufficient percentage to all of the gasoline now used.

The meeting was well attended, the ballroom of The Automobile Club of America being completely filled. It was preceded by the usual informal dinner, at which the S. A. E. baseball championship cup, which was won by the Metropolitan Section Baseball Team at Ottawa Beach last summer, was formally presented to the team by Chairman Beecroff of the Meetings Committee.

The Blooming Oil Cup

A NEW way of feeding oil automatically to the chassis bearings of an automobile or motor truck is embodied in the Blooming Cup herewith illustrated. The feed is caused by the vibration or jar of the car in motion, and it positively stops when the car comes to a standstill. The action of this cup is as follows, according to the manufacturer:

After the cup has been completely filled with oil, there being an outlet *F* through the top of standpipe *C*, the oil will quickly seek the level *D-D*. The small amount which drains away gives the bearings a preliminary flushing. The cap is then replaced and no further lubrication takes



Blooming oil cup

place until the car is started. With the car in motion, a surging action is started and the oil splashes and gathers on the inverted cone *E* on cap *B*. A drop is formed on the apex *E* on the cone and forms a seal over hole *F*. The drop is held back by the vacuum in the cup until capillary attraction through the flexing action of the bearing (creating a suction) causes it to be eventually dislodged to lubricate the bearing. This action continues while the car is in motion.

When the oil level drops below line *D-D*, the top of the standpipe, the vacuum formed further reduces the resistance offered to its splashing action.

A Definition of Industrial Relations and Its Related Terminology

Two persons sometimes argue about a point at length, only to discover that they have each had in mind a different definition of the words and terms they have been discussing. To clarify the articles on industrial relations in AUTOMOTIVE INDUSTRIES, Mr. Tipper defines the various terms.

By Harry Tipper

THE discussion of industrial relationships, labor, labor unions, socialism and other labor matters has developed to such an extent that the terminology is becoming confused already, and there is little or no definition as to the scope of the terms which are used by different writers nor the limitation which should be imposed upon them for the orderly progress of the discussion and the study.

It frequently occurs that labor is used as though it were synonymous with manual labor and it is just as frequently linked with the labor union.

A great many people have discussed welfare as though it covered the whole field of the human side of industry and the terms employment manager, industrial relations manager, welfare department, etc., are used in various lines of industry and various concerns to indicate similar duties or those which are conceived to be the duties of industrial relations.

This lack of definition in the terminology is the indication of the confusion which exists in the whole discussion of the matter. It is necessary to define some of these terms in order to establish a basis upon which the argument may be continued and those definitions must be understood if the scope of the discussion is to be realized.

I have in the past two or three weeks attempted to secure a definition of the term industrial relations from a number of men and no two of the definitions agree, while most of them were not definitions at all, but descriptions which did not define. For the sake of establishing the broad basis on which the narrower terms can be logically secured, it is necessary to define industrial relations first.

The term industrial relations will be used in these discussions to cover the necessary relations which exist between human beings engaged in the production, development and distribution of products or industrial service. This means that everything in the relations which exist between the different people engaged upon industrial pursuits is a matter of concern to the student of this subject. It means also that all branches which deal with the human being engaged in industry are distinctly related and no one branch can be properly understood without a corresponding knowledge of the rest of the branches.

This study is, therefore, not a study of separate operations which might be conceived to exist without one another, but a study of the relations in human action and reaction, the operations which are necessary to preserve

the proper equilibrium in these relations and the factors which enter into the total equation. It is necessary to emphasize this development of the matter, as there is a tendency even now to separate the study of industrial relations into a number of separate branches which are not brought together effectually and none of which are wholly successful in giving a proper view of the whole situation.

The intimate relation between the labor movement and socialism and between great combinations and socialism is lost sight of because these have been studied as separate subjects and not as related developments growing out of the extended character of industrial operations.

Fatigue and its effects upon efficiency have been considered very carefully from a medical standpoint, but its relation to the psychological attitude of labor has received little attention because it has been studied as a separate subject and the intimate relation of its developments with other movements in industry has not been thought of to the proper extent. There is great danger that this tendency to separate different branches which enter into the study of industrial relations will add very greatly to the discussion of these branches, and the literature affecting the technicality of these branches, without adding largely to the general understanding of the whole subject and without giving us either the proper perspective or the logical proportion which is necessary to its proper solution.

Labor generally should be defined as the work connected with keeping the industrial organization moving and in this respect it must include all kinds of work and all kinds of workers. For the purpose of distinction it has been classified into manual labor and mental labor, and the workers have been classified manual workers and brain workers. The classification is inexact as there is very little work in industry which requires no manual labor, and there is very little work in industry which requires no mental activity of any kind. Classification is not only, therefore, inexact, but its acceptance without question has led to a total disregard of some of the factors which enter into the question of industrial relations as they pertain to the attitude of mind of the worker toward his work and toward the general system.

No matter how small the amount of mental activity required for the occupation which is pursued by a worker, the intellectual stimulus is there either in the work itself, in the surroundings of the work, in the amusement, the social, the political or the religious aspect of

the worker's life, and the effect of this intellectual stimulus will be found in the character of the work, the quantity of the work and the attitude of mind toward the work. On the other hand, no matter how much intellectual labor there may be required of the worker in his occupation, there is always sufficient routine, sufficient of the tedium of repetition and the similarity of operation, to produce to some extent, mental reactions of a similar character to those which exist at the other end of the scale.

In these articles, in classifying labor into manual and brain workers, unskilled, semi-skilled and skilled, it should be understood that this classification is merely adherence to custom and for the sake of avoiding new definitions which would require a great deal of explanation. Where these terms are used, however, they are used simply for the purpose of roughly classifying the duties of the workers and not as an attempt to classify them humanly in the same respect.

Labor unions are organizations composed of those who are engaged in the same kind of work for the purpose of securing the advantages and protection industrially, which arise from the close co-operation of men interested in the same occupational problems. I realize that this is extending the definition and that it would include many other organizations than those which are commonly referred to as labor organizations. But unless we are to become entirely confused by the various types of organizations which are springing up, we must find some generic term for all organizations of workers mainly brought together for their common protection or advantage and then classify these in accordance with their general aims and objects. "Trade union" signifies the present types of craft unions or trade guilds, as they were originally called, the trade or craft designating those who had passed an apprenticeship and reached journeyman efficiency in the operation of a trade or a craft. At the time that the word trade was used first, it was confined to those industrial occupations where the manual skill in the use of tools was the important development.

Industrial unions: These are unions of all kinds of workers engaged in the same industry. Naturally these unions include workers of all types and all degrees of manual and mental skill. They arose much later than the craft or trade unions and they have received their impetus from the growth of large industrial operations.

Professional organizations: these are organizations concerned with occupations which are not trade, which are not necessarily industrial, although they may be connected with industry. Associations of teachers, musicians, authors, etc., are excellent examples of this type of organization.

Other occupational organizations: These are organizations which are formed by workers of similar occupation which are neither trade nor professional in the original acceptance of these terms. Unions of clerks, associations of accountants and other bodies of similar character are examples of this type.

Employment covers that branch of industrial relations concerned with the securing of the right people for particular work, observing the conditions of their employment and recording the necessities of employment and discharge as well as the analyses to be drawn therefrom.

Training and education cover that branch of the subject of industrial relations dealing with the improvement of the workers in their capacity to perform the work and their education in the reasons for, and the

value of that work and other general mental developments along necessary industrial lines.

Welfare is that branch of the subject of industrial relations dealing with the necessities of the physical well-being of the worker either in connection with his work, in connection with the surroundings of his work or in connection with the influence which may be exercised by the industrial organization upon the social conditions. I realize that welfare as a rule is taken to include the training and education and is either included in or affiliated with the employment work. But the present methods of dealing with it have grown to be very largely from the circumstances of the individual plant and have no relation to a logical consideration of the subject.

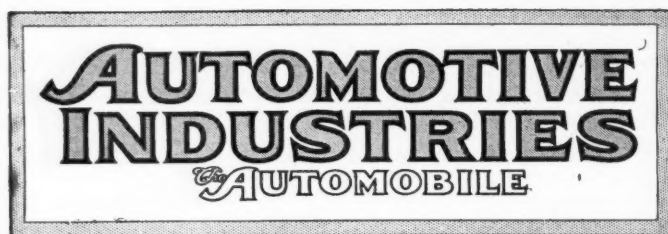
Management and supervision: This is the most important branch in the whole subject of industrial relations, although it has been viewed up to the present as a technical, separate department of knowledge dealing largely with processes and products, systems and methods, and the literature which has been built up around this subject has approached the matter in this way. Management is that branch of the subject of industrial relations dealing with the selection of the right individuals to work together on the common problem at issue, the maintenance of these individuals in an orderly and efficient co-operation and the development of these individuals so that the co-operative effort will be competent at all times to surmount the difficulties which may arise in connection with the common problems of the work.

Obviously this is the real job of management. The system by which these individuals shall be kept at work without confusion is subsidiary to securing the right individuals so that they can work together. The method by which a co-operative endeavor shall be carried out is subsidiary to the development of the elements of co-operation among the individuals who must carry out the work.

Every worker who fails is a failure of the management, either in the selection of the worker or in the placing and developing. Every reduction in the per man efficiency is a failure of the management in its maintenance of the elements of co-operation, every confused method, every illogical procedure, lack of balance in department personnel, and all such matters are failures of management and arise either from lack of the right selection, lack of maintenance of the spirit of co-operation or lack of understanding of the problem.

Supervision is the disciplinary department of management made necessary by the fallibility of human nature and the supervision is so closely related to the success of the management as a whole that the conditions respecting it are similar to those just mentioned. These are some of the terms used in the articles in AUTOMOTIVE INDUSTRIES, in which the question of human relations has been discussed. Other definitions must be made in order to clear the ground work and the next article will attempt to consider the matter in respect of labor organization machinery, the definition of employers' organizations, capital and other terms which must be used just as constantly as those which have been presented.

THE discovery of a new alloy, with important industrial possibilities, is announced by the Academy of Sciences, Paris. It is to be called Elinvar, and has been made by M. Guillaume, inventor of Invar, an alloy which is extensively used by makers of scientific instruments in France. The new alloy, it is claimed, is an improvement on Invar, and is peculiarly valuable by reason of its uniform elasticity.



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Automotive Industries—The Automobile is a consolidation of The Automobile (monthly) and the Motor Review (weekly), May, 1902, Dealer and Repairman (monthly), October, 1903, and the Automobile Magazine (monthly), July, 1907, and The Horseless Age (semi-monthly) May, 1918.

Building Freight Cars

IN the current Traffic Bulletin of the National Automobile Chamber of Commerce we read that the general traffic situation of the country, especially as pertains to automotive shipments, is much improved. Also that much progress is being made in demonstrating to those in authority that it is quite necessary that automobile freight cars be not transferred to other shipments.

This is indeed cheering. It is excellent news that the persons who rule in the freight car world should recognize the rights of the industry to its own equipment. There was a time when these same powers would have countenanced a transfer of these cars to other industries without a second thought. But there is in this same bulletin a note that is entirely out of harmony with the good cheer.

We read this sentence: "An unfortunate feature of the present railroad situation is the delay in unloading cars by automobile dealers." It is difficult to believe that while a section of the industry is working

so energetically to improve conditions, that others are undoing this work by pure neglect of an ordinary business. Surely every business man to-day realizes that each delay he causes by holding a freight car is putting off just that much the movement of merchandise that will again bring good business. Each factory traffic department should take up the question of prompt unloading with the dealers to whom it makes shipments. In this case time is money.

Punch Presses and Production

DURING a recent discussion concerning the possibility of adequately protecting punch press operators from danger, one manufacturer is said to have claimed that in certain cases it was impossible because production would be greatly hampered by the installation of any guards. To illustrate his point, he took his visitor out in the shop where one punch press operator was working very rapidly. It was necessary, however, for this operator to place first one hand and then the other between the jaws of the press in order to attain the exceptionally high production which he was making.

"See that man," the manufacturer said, he makes higher production than any man we have; he has the thing down to a science; he doesn't make one unnecessary motion. He works on piece work and would never stand for our putting safety appliances on that machine because it would cut his earnings so greatly. So you see, there is one operation, at least, where safety appliances are not practicable." And mentally he probably added with real conviction, "Q. E. D."

This same argument against the placing of safety devices upon punch presses has been used by others. The safety device would cut production, and consequently lower the operator's earnings. Thus it would not benefit either the company or the man.

There is another point of view, however, which is pertinent to the discussion. It is not likely that the operator would object to the placing of a safety device on the machine if his earnings were not cut. Granting that fact, it is justifiable to put the question, "Has the manufacturer a right to set such a rate that it is necessary for the operator either to risk his hands and fingers for eight hours a day or fail to make a normal day's pay?" It would seem fair to set a piece rate consistent with the safe as well as the efficient operation of the machine. The question brings up again the important discussion as regards the moral obligation of employer and employee to one another.

Even in a more practical sense, the manufacturer is likely to find it to his advantage to operate his punch presses on a basis of safety as well as production. The punch press department of a small New England plant employs about twenty men. A series of accidents occurred recently in one week. Scattering accidents had happened before, but during this particular week, one hand, and something like seven fingers were lost, about four or five men being injured.

The next Saturday eight men quit the job and about ten others applied for transfer to another de-

partment. A very definite loss in labor turnover and in breaking in new men to the job accrued to the factory, in addition to the actual loss caused by the injury of the men. Something definite is now being done in this matter at this particular plant.

A wide survey reveals a remarkable number of cases in which the conducting of every phase of human relationships in close harmony with the best moral and ethical teachings goes hand in hand with large production and successful operation.

Eight Cylinder All-in-Line Engines

OWING to its successful use in racing cars the eight cylinder-in-line engine stands a good chance of being adopted for passenger cars of a certain class. This is a type of engine the characteristics of which have never been closely investigated, except possibly by the engineers who have used it for racing. In the case of all the engine types regularly used in commercial practice we have what may be considered standard forms of crankshaft; that is, the arrangement of the crankpins relative to each other is always the same. But in eight cylinder-in-line engines this uniformity has not yet been attained.

In using as large a number of cylinders as eight, one of the objects aimed at is to reduce the force of individual explosions, and another to eliminate the effect of inertia force as far as possible. In a four-cylinder engine the primary inertia force is entirely balanced out or neutralized, and only the secondary inertia force remains. This is an harmonic force of twice the frequency of crank rotation. In other words, the resultant inertia force in a four-cylinder engine passes through a complete cycle in 180 deg. of crank motion. Therefore, if we add to a four-cylinder engine at one end another of the same size and connect the two crankshafts so that the plane of one makes 90 deg. with that of the other, then the resultant inertia forces of the two engines will always be a half period apart and the two will cancel each other.

But the two forces, while equal and opposite in direction at all times, do not act along the same line.

There is, in fact, a considerable distance between their lines of action, and, in consequence, there will be a considerable rocking couple in a longitudinal plane. The eight cylinder-in-line engine therefore is not quite on a par with the six-cylinder as regards mechanical balance.

The arrangement of crankshaft above described is mostly used for eight cylinder-in-line engine, no doubt chiefly because of its ease of manufacture. It is not the best arrangement from the viewpoint of balance of reciprocating parts, however. The rocking couple in the fore and aft plane can be greatly reduced by placing all odd crankpins in one plane and all even numbered in another at right angles thereto. In that case the lever arm of the rocking couple is only one-fourth as great, considering the distance between adjacent cylinders the same throughout. The reason this design is not used is undoubtedly that it is more

difficult to forge. With the first-mentioned construction it is only necessary to twist one main bearing of the forging through an angle of 90 deg., while the last mentioned every one of the seven intermediate bearings would have to be thus twisted.

There are two other forms of crankshaft which can be used with an eight cylinder-in-line engine, both four throw. The first may be considered as a four-cylinder form of crankshaft with its central main bearing twisted through an angle of 90 deg. and the latter as the same kind of crank with throws 2 and 4 turned through 90 deg. angles in the same direction. With both of these simplified constructions not only is there a rocking couple in the fore and aft plane, but there is also a free harmonic force tending to cause vertical vibration. This free force is the same with both types of crankshaft, while the rocking couple is only half as great where all adjacent crank throws are at right angles to each other.

It would seem that where smooth operation is such a desideratum that the complication of eight cylinders is warranted, one or the other of the two first described crankshaft types should be used, so that the free vibrating force at least is eliminated.

Why Not Service?

THESE are comparatively quiet times in some of the automotive factories. Production has been lessened somewhat in most factories. This condition is not serious enough, as it is in some lines, to warrant these factories going into other lines of manufacturing, and in almost every case the manufacturers are entirely confident that within a few weeks there will be a decided turn for the better.

This hopefulness appears to be entirely warranted and this view was the one commonly expressed by the men gathered at the Motor and Accessory Manufacturers' Association meeting in Cleveland last week. But the fact remains that some of these factories are a bit at a loss to know on what lines they can most profitably continue operating for a few weeks.

Judging by reports from the sales centers, it might be suggested that a good many factories could well employ this somewhat lax period with preparing and shipping to many sections of the country parts for the cars and trucks that have been on the road for some months, perhaps years. The writer does not recall ever having heard complaints as unanimous as those recently sounded by the various service stations as to the stocks of parts available for service work. Many service managers have been compelled to depend on orphan parts dealers for their repair parts. Some of the smarter of these service men have learned what other cars or trucks use—parts that are interchangeable with theirs—and have managed to keep the work going forward by "shopping" among competitors.

The writer can think of no one thing that would be more helpful to the industry as a whole than to fill these parts bins in the service plants. It will make for good service from the vehicles, for a better public opinion and for profits.

Ford Prices Drop to Pre-War Basis

Reduction Ranges 20 to 30 Per Cent

Company Will Accept Temporary Loss on Accumulated Stock —No Wage Cuts

DETROIT, Sept. 21—A general reduction in prices of cars, trucks and tractors to figures approximating the pre-war basis were put into effect at midnight last night by the Ford Motor Company.

The following reductions are mentioned in a statement issued over the name of Henry Ford:

CARS	OLD PRICE	NEW PRICE
Chassis	\$525	\$360
Roadster	550	395
Roadster, with electric starter	625	465
Touring	575	440
Touring, with electric starter	650	510
Sedan (starting system and demountable rims)	975	795
Coupe (starting system and demountable rims)	850	745
TRUCKS		
Chassis	600	545
TRACTORS		
Fordson	850	790

Coincident with the report of the wholesale reduction in prices for the Ford product, comes the announcement from Ford that there will be no reduction in wages at the Ford plants.

Ford's statement follows:

"There will be no reduction in wages at the Ford plant. We must take a temporary loss by reason of having stocks and materials on hand bought at inflated prices. But we take it willingly in order to bring about a going state of business.

"The war is over and it is time war prices were over. There is no sense or wisdom in an artificial standard of values. The best interest of all demands the real practical effort to bring business and living conditions down to normal.

High Prices Retard Progress

"Inflated prices always retard progress. We had to stand it during the war, though it was not right.

"The Ford Motor Co. will now make the price of its products the same as before the war and this in the face of the fact that we have unfilled orders for immediate delivery of 146,065 cars, trucks and tractors.

"Raw materials are being stored; manufactured goods are being stored, because the volume of consumption is

TABLE SHOWING RANGE OF PRICES ON FORD

	Aug. 1, 1916	Aug. 1, 1917	Sept. 21, 1917	Oct. 16, 1917	Feb. 25, 1918	Aug. 16, 1918	Mar. 4, 1920
Touring ..	360	360	365	365	450	525	575
Roadster ..	345	345	350	350	435	500	550
Chassis ...	325	333	338	338	400	475	525
Coupelet ..	505	505	510	560	560	650	...
Coupe .....	...	...	...	...	...	...	*850
Town Car ..	595	595	600	640	640	...	...
Sedan	640	645	650	695	695	775	*975
Truck .....	...	600	600	600	600	550	600

* Includes starter and demountable rims.

growing less and less and less, through the self-denial of the people, many of whom could not afford to pay the high prices. Others would not pay the high prices, because they felt the injustice of the situation. Manufacturing plants are being shut down all over the country. Labor is being thrown out of employment, yet the cost of living has seen very little reduction.

"Our country is rich beyond measure in natural resources, rich in all the material things which go to make a nation great, and yet its progress is being held practically at a standstill because of the greed of profiteers."

First Price Over 1,000

The history of Ford prices has always gone by contraries. At a period before 1910 the car was over \$1,000 and was reduced each year on Aug 1, the beginning of the Ford fiscal year, until 1916, when it reached its lowest point. At that time Henry Ford told the public that it was his aim to turn out a roadster for \$250, and later he predicted the time when a farmer would be able to buy a car, truck and tractor for \$1,000. By increasing the wages of his men to a minimum of \$5 per day when the average wage in other factories was around \$2.50 per day, Ford was able to increase the efficiency of the men to a point where the car was actually produced for less cost than under the lower wages. Incidentally, Detroit became a mecca for workmen, and at one time there was such a large number of applicants storming the doors of the Ford employment office that the city fire department had to be called out to disperse the men so that the factory hands could get out.

In 1914 Ford started his profit sharing plan, in which he enlisted every owner of a Ford as a helping salesman. His plan was to sell the cars for the prices listed under the column marked Aug. 1, 1914, in the above table. He agreed, that if the total number of cars sold

(Continued on page 644)

Packard Earnings \$10,044,952 for Year

Business for Fiscal Year Aggregates \$62,579,240—Light Six on Market

DETROIT, Sept. 20—Packard Motor Car Co. in its annual statement as of Aug. 31, reports net earnings before Federal taxes of \$10,044,952.03 out of which there has been paid regular cash dividends on preferred and common stock of \$2,511,441.31. It is estimated that net earnings on the outstanding common stock will have exceeded 50 per cent per annum after payment of the preferred dividend.

Except for \$5,000,000 representing loans from its banks the company, according to the statement, had no debts outstanding save for current purchases.

At the close of the year the company had on deposit at the banks \$3,342,865.82, leaving a balance due these banks on the \$5,000,000 debt of \$1,657,134.18. The statement also lists drafts in bank for collection but not discounted, with bill of lading attached, amounting to \$926,895.47. This leaves the net indebtedness to banks \$720,237.71. In addition to cash on hand the report lists cash assets of \$10,787,368.26 and total net assets over and above all liabilities and charges of approximately \$49,223,122.96. Surplus over all liabilities and stock outstanding is given as \$22,114,522.96.

Accompanying the annual report, President Macauley's statement summarizes the results of the company's operations for the fiscal year which is declared to have been the greatest in its history. The statement refutes the gloomy forebodings and predictions regarding the industry and discloses a record-making volume of business, the report itself showing the company to be in an unusually strong financial condition.

A volume of business aggregating \$62,579,240.13 is reported. Macauley's statement also declares the company has begun shipments on the new single 6 which will increase steadily. The new car, Macauley says, has received a hearty welcome from Packard distributors and that portion of the general public which has had an opportunity of seeing it.

BOLLSTROM PRESIDENT KILLED

SAGINAW, Sept. 20—H. H. Soule, recently elected president of Bollstrom Motors Corp. of St. Louis, Mich., was instantly killed in an automobile accident near here Friday night. The machine which he was driving skidded in fresh gravel and overturned into a ditch. Soule's neck was broken.

Credit Situation Improves in West

Chicago Banks Find Depression Overdone

Not So Much Overproduction as Overconsumption—Conservative Business Safe

CHICAGO, Sept. 20—The belief that much of the feeling of depression which has been current in practically all lines of industry has been to a more or less extent unjustified is rapidly gaining ground in this section of the country, and is being stressed to a great degree by bankers. They find that there has been not so much overproduction as there has been overconsumption; that the curtailment of credit and restrictions placed upon the purchaser have caused a reaction upon the consumer which has reduced consumption and brought it below its natural level, and that the period of reaction is fast approaching an end, and inflation has been checked, at least. Some bankers here, indeed, hold that deflation is well under way.

What the country has been passing through was to be expected. For several years there has been a period of inflation which must, through the very nature of things, culminate in a period of readjustment. Conditions are as good as could be expected in a situation as it exists in a post-war period of readjustment. The credit situation is improving, and while bankers hold that loans will continue to be restricted there are evidences showing a tendency toward easier money. The crops are good, all important crops exceeding those of last year with the possible exception of wheat, and when the money necessary for their movement has been released and turned into other channels conditions will be materially bettered.

W. A. Heath, chairman of the Chicago Federal Reserve Bank, told the members of the Illinois Manufacturers Association a few days ago what the banks in the system had accomplished in placing restrictions on credits.

Good to Check Speed for Time

"The complaint is frequently heard," he said, "that the Federal Reserve banks are not properly supporting and encouraging current business, but the expansive power of the reserve banks themselves is not limitless. It is frankly admitted that the restraining policy which has been exercised has its effect upon the man who is doing a strictly legitimate business as upon the man who is speculating or profiteering. Is it not better to lessen speed for a while in order to eliminate the reckless, unworthy dealer in whatever line and permit a legitimate,

conservative business to make a new inventory of its assets and liabilities?"

All branches of industry, more particularly those which had sprung up as a result of the war or were the outcome of the unprecedented prosperity which the country has enjoyed, could not be expected to sail through the ruffled waters incident to readjustment of conditions without some reefing of sails or a few wrecks of the less seaworthy craft.

Embarrassments Not Excessive

"While commercial embarrassments are more numerous and more extensive than for some years past, they are not excessive," says the National Bank of the Republic of Chicago in its monthly review of business, "they indicate simply the elimination of those concerns of small capital and experience which always float in at the flood tide of prosperity and which are always the first to be left stranded when the tide recedes. Seasoned concerns, on the other hand, while not unaffected by the general contraction in business, are reducing inventories and building up cash reserves, not only in anticipation of possible financial squalls, but also in preparation for the next period of business expansion."

The Continental and Commercial Bank of Chicago reviews the general business situation for 1920, based on more than 5000 reports from trained observers and business men, and finds that "the interesting and outstanding feature of the whole is the confidence and optimism of the business world in the face of many adverse conditions and tendencies."

In stating its conclusion relative to the automobile industry, it quotes from one reporting concern as representative of the sentiments of nearly all:

Reckless Buying Days Over

"There is no question about there having been a slump in the automobile industry. The days of reckless buying of automobiles are over, but there will always be a big demand for standard makes of cars in both the domestic and export markets. The automobile is an established fact. We look to see some failures in the automobile business, but we think the strong companies, while suffering some diminution in business, will continue to be prosperous."

The First National Bank in St. Louis concludes its review of conditions with saying: "That greater efficiency in production is being secured and that the decrease in the per capita production since 1914 has not been as great as has been assumed. The productive capacity of the United States is very great, as was amply demonstrated during the war, and the dire predictions about the great length of time necessary for production to catch up with demand is not warranted."

Milwaukee Feels Force of Reaction

Survey Shows General Conservation in Employment of Labor—Three Shifts Abandoned

MILWAUKEE, Sept. 20—Milwaukee, as one of the most important automotive parts producing centers in the United States, is feeling the effect of the general curtailment of vehicle output, which began with passenger cars and is now reaching into the motor truck industry and the tractor trade.

A survey of industrial conditions generally shows that practically all plants profess an optimistic attitude, but all are following a conservative policy in employment of labor. It is found that some plants are purging themselves of semi-skilled labor to absorb the more highly skilled men who are available by reason of the cutting of forces in some plants depending directly upon the automotive industries for patronage.

Milwaukee is regarded as the first industrial center of America in respect to diversified manufactures, as a consequence of which a temporary decline in a single line, even be it among the most important, does not cause an upset condition in labor. While 24-hour a day operations generally have ceased, several plants continue to be so pressed for production that three full 8-hour shifts are maintained.

War-time conditions of acute labor shortage resulted in the upbuilding of a relatively enormous class of semi-skilled labor. Common workmen were trained for the more skilled vocations as rapidly as possible. The bulk of these men have never reached a stage higher than semi-skilled. It is in the working down of this liberal supply that practically all unemployment now existing has resulted. It is a fact, however, that the amount of unemployment in Milwaukee is small and has not been felt or made itself known to any appreciable degree.

Plants Get Detroit Overflow

Officials of the Federal Employment Bureau say that a considerable number of men are coming here from Detroit to seek work. Some of these men, when highly skilled, are absorbed without difficulty into machine shops and foundries manufacturing steam and hydro-electric generating machinery, railroad materials, machine tools, steam and oil engines, mining and oil equipment, and similar machinery, the demand for which continues to be very satisfactory. Others are being trained for work which Milwaukee holds out to them and quickly find places.

Prosperity Hinges on Rail Efficiency

Success in Moving Crops and Coal
Before Winter Tie-up Im-
portant to Credits

NEW YORK, Sept. 20—With the approach of winter the business world will do well to focus its attention once more upon potential transportation difficulties. As AUTOMOTIVE INDUSTRIES has reiterated in its reviews of general business conditions, there can be no general prosperity without adequate transportation. There unquestionably has been a marked improvement in conditions in the past few weeks but the country should not be lulled into a false sense of security.

The morale of the railroads has risen since the rate and wage increases. This applies both to executives and the rank and file. The switchmen's strike never has ended, however, and there still is a considerable deficit of skilled and experienced men. Better speed is being made in getting equipment through the repair shops, but there is plenty of room for improvement in this regard. Greater efficiency also is apparent in the capacity loading of cars.

There have been no material accessions to the supply of equipment, however, and there cannot be for several months to come. Few large orders have been placed for cars and locomotives. Until their equipment needs are filled the carriers cannot transport the amount of freight which would be offered them under normal conditions.

Normal manufacturing conditions do not obtain at present. There has been a very marked shrinkage in the volume of manufactured products. This is due partly to the usual summer slump but more largely to unsettled industrial conditions and a slackening of demand which has led to curtailment of output.

Greater efficiency marks the operation of the railroads at present because the volume of business offered them is nearer their carrying capacity. Even with a shortening of demand for cars in the industrial East the car supply for the agricultural West is far below what it should be to insure prompt movement of crops.

Coal Supply Below Normal

Naturally the railroads cannot function as efficiently in winter as in summer and they will not be able to handle then as much freight as they are moving now, and they will not be able to handle it as promptly and efficiently. It must not be forgotten that the reserve supplies of coal are far below their usual size. While this is particularly true of bituminous, the interference with the production of anthracite resulting from the "vacations" of operators has prevented the piling up of the usual stocks of hard coal. The outlook is particularly discouraging in the great Northwest, which is steeling itself to the prospect of heatless days next winter.

Inability of the carriers to move promptly the bumper crops with which the country has been blessed will be reflected in the credit situation throughout the country. Enormous sums of money are tied up in agricultural products and these potential credits will remain "frozen" until the fruit of the farmer's labor reaches market. This not only will prevent the banks from making new loans which might find their way to automotive dealers, for example, but it will find a reflex in the capacity of the country merchants to absorb goods of all kinds.

When the farmer is unable to market his crops he is able neither to pay his bank loans or to buy goods. Delay in crop movements will retard the financing of trucks, tractors and agricultural machinery.

Steel Companies Get Freight Car Privileges

YOUNGSTOWN, Sept. 18—Large numbers of box cars are coming into Youngstown and being distributed through the local terminals for use in general freight shipments in the West and Central West as a result of the anthracite strike in northern Pennsylvania. These cars were used for transportation of anthracite coal to distant markets, in preference to open and hopper cars to protect the coal from theft. Vast quantities of mine supplies and other materials are moved into the mine districts in box cars.

Shutting down of the mines ended the major part of this traffic and is diverting the cars for other purposes. Several hundred additional box cars have been assigned to Mahoning and Shenango Valley manufacturers since Sept. 13 by the railroads affected by the anthracite situation. These cars are proving a most welcome relief and they are being loaded to all points of the compass. Steel sheets and tinplate shipments were materially increased as a result. More than 50 automobile cars were placed for loading with shipments to Detroit and Indianapolis this week.

ANN ARBOR MACHINE BANKRUPT

DETROIT, Sept. 20—Attorneys for the Ann Arbor Machine Corp. filed a petition in bankruptcy in the Federal courts here to-day, listing liabilities at \$521,374.79 and assets of \$484,968.20. The petition recites that the business for two months has been conducted by a creditors' committee, during which the committee incurred a debt of \$35,622.21.

Claims listed in the debts, in addition to business concerns throughout the State, include \$1,481.82 due sixty-two workmen for wages in amounts ranging from \$10 to \$20 each.

According to the petition the secured claims total \$125,515.81 and the unsecured \$394,212.16. George W. Langford is president of the company. The firm manufactures castings, and was making a silo filler which was to have been marketed with the Fordson tractor.

Cumberland Tire Buys Ten Broeck

New Company Will Produce Cord
Tire Starting in October—
Plans Extension

LOUISVILLE, Sept. 20—Purchase of the Ten Broeck Tyre Co. plant by the Cumberland Tire and Rubber Co., recently incorporated for \$6,000,000, was announced to-day following a meeting of stockholders of the former concern.

Improvements at the plant, including two new buildings and equipment, will take place beginning within thirty days and continuing next spring, amounting to \$1,000,000. Operations at the plant will begin about Oct. 15, the product to be known as the "Cumberland Cord Tire."

The new concern is under the management of Frank W. O'Brien, formerly of Elyria, Ohio, and the president of the Superfix Tire & Rubber Co., and vice-president of several other tire manufacturing corporations. Samuel J. Dant, Louisville, is secretary and treasurer of the company; A. L. Henry, president of the Standard Metal Co., Indianapolis, is chairman of the board of directors. W. W. Crawford is general counsel.

Two mills will be operated, one a fabric mill and the other a tire manufacturing plant. The fabric mill will be housed in a new building 180 by 200 feet to be put up next spring, costing \$300,000, it is said. The present plant will be used until that time. The tire manufacturing plant will occupy the present building and an extension over the old fabric plant to be put up as soon as the latter is abandoned. The extension will cost approximately \$350,000, including equipment.

The Ten Broeck plant was closed down several months ago, except the fabric mill, which continued in operation until two weeks ago, when negotiations for sale of the property were completed.

MICHELIN EXTENDS PLANT

MILLTOWN, N. J., Sept. 21—Contracts calling for a new storehouse of reinforced concrete to measure 60 x 125 ft., and having a total floor area of 15,000 sq. ft., with a cubic capacity of 240,000 ft., has just been let by the Michelin Tire Co. This contract follows closely on the heels of one recently awarded for the erection of a new machine shop and turbine house—each of steel framework and brick body. Both are now in process of construction.

LIMA STEEL CASTING CLOSES

LIMA, OHIO, Sept. 20—The Lima Steel Casting Co., employing 300 men, has closed down for an indefinite period.

M. L. Johnson, general manager, declared slack business in the motor truck and allied industries prompted the shut-down until conditions become normal. The plant supplied castings for the automotive industry.

Direct Results Aim of Advertising Men

M. & A. M. A. Managers Hear All Sides of Problem at Clevel- land Meeting

CLEVELAND, Sept. 18—There was a good deal of optimism in the session of the Advertising Managers' Council of the Motor and Accessory Manufacturers' Association at Nela Park here yesterday and to-day. This optimism was a most decided feature, despite the frank assertion at the opening of the meeting that the advertising managers were entering on a period of smaller appropriations during which more direct results must be shown.

The topic for the meeting was "How Can We Turn Our Prestige Advertising Into Cash?" E. C. Tibbitts of the B. F. Goodrich Rubber Co., chairman of the council, in stating the object of the meeting and in introducing the several speakers, dropped hints for useful application from his wide experience in the several recognized forms of advertising.

W. H. Huff, advertising manager of the Detroit Pressed Steel Co., was the first speaker and he frankly stated that his investigations indicated that there was to be a let up in the volume of purely prestige advertising and that he thought that all of the advertising managers were confronted with the problem of getting more direct results from the money expended. He advised more direct work with the salesmen along the lines on which the prestige advertising had been conducted, so that these men might be able to cash in on the work done. Most advertising departments, he thought, would not be better for a lessened appropriation for office work and the consequent less attention to doubtful forms of advertising.

To Feature Transportation

A suggestion that was well received, was that all advertising departments give more attention to the advertising of the automotive vehicles as a necessary part of the transportation problem. In this feature of the work he favored a co-operative movement, not only through the M. & A. M. A., but closely linked with the work the National Automobile Chamber of Commerce, the National Automobile Dealers Association and other work of this kind. The object of this advertising should be to stabilize the vehicles through which the parts made by the members of the M. & A. M. A. are sold to the public. Such advertising, it was represented, would strengthen the industry.

By invitation of the council, representatives of the several forms of advertising were present to answer the general topic of the meeting from their particular field. National advertising, especially the magazine form of advertising, was represented by Mr. Nelson of the Crowell Publishing Co. His presentation was a frank admission that

this form of advertising was chiefly prestige advertising and it had no immediate solution to offer. Nelson left the thought that no advertising of a commodity over the entire country could be complete without magazine support.

The newspaper side of the presentation was handled by C. E. Greenfield of O'Mara & Ormsbee, publishers' representatives. He presented the newspaper as the flexible medium, one which carried the quick message of change of prices, that was able to meet the local situation in any part of the country at any time. Through newspapers, the quick message could be carried either into the home or to the business man.

Presents Mail Advertiser's Views

Homer J. Buckley, of Buckley, Dement & Co., answered for the direct mail advertisers. His talk was chiefly devoted to a presentation of the business side of handling the direct mail appeals and a warning against carelessness in preparing the subject matter to be mailed, the failure to examine the lists to be used and the need of a campaign plan before wasting money on preparation. He described how direct mail advertising could always be made to supplement any form of prestige advertising, like the spoken word of the salesman. He said the great waste to-day was in the use of badly prepared lists.

Trade journal advertising was presented by Clyde Jennings, managing editor of AUTOMOTIVE INDUSTRIES. He suggested that the trade journals were most useful in building up of service and of carrying to the dealer, the garage owner and the automotive manufacturer the more technical details of the article advertised. In the automotive industry the details of technical construction did not lend themselves to general advertising but it was necessary that the men who stood between this article and the buying public should be well informed as to details that they might have the utmost confidence in the article. In recent advertising, many articles have been presented to the public through excellent general advertising, but that the men in the sales end of the industry knew no more of these articles than did the general reader. A series of more intimate advertisements in the trade journals would correct this rather serious situation and bring about dealer co-operation and direct results. Trade journal advertising is the professional side of an advertising campaign.

Outdoor Advertising Suggestive

Outdoor advertising was presented by H. Prescott Simpson of the Thomas Cusack Co. Simpson frankly stated that his form of advertising was not of the emergency type, nor was it well used to promote bargain or immediate sales. It contained a better power of suggestion, in his opinion, than in other forms but could not present details.

On Saturday Miss Webber, advertising manager of the Fisk Rubber Co., told "How to Keep Track of the Advertising Dollar."

Willys Cuts Force to Meet Conditions

No Truth in Report of General Resignation of Officers—Go on 300 Schedule

TOLEDO, O., Sept. 20—During the past few days widely circulated rumors have been prevalent to the effect that many officers of the Willys-Overland company had resigned. Clarence Earl, vice-president, yesterday denied that Le-Roy Kramer, vice-president, A. J. Kehoe, attorney, N. E. Hitchens, counsel, and A. D. Lightner, terminal director, and himself, had resigned as reported.

A considerable reduction in the office force of the company and in the higher executives of the factory organization has been made this week. The resignation of the superintendent of the traffic department, Ralph Caples, and of Harry Goodall, of the assembly department, is confirmed.

"We regret very much the necessity of reducing the working force and our office force, but money conditions have been responsible," Earl states, "The dealers have not been able to buy cars and reduction in our production has become necessary."

The present organization of the plant constitutes about 50 per cent of the high production capacity recorded within the last year. Production of 300 cars a week is now being maintained, and it is hoped that this will be kept up without any further reduction in the working force of 7,500 men.

RUGGLES TRUCK INCORPORATES

LONDON, ONT., Sept. 20—With a capitalization of \$3,000,000, the Ruggles Motor Truck Co., Ltd., has been incorporated. Property on Dundas Street, immediately east of the McCormick factory, London, has been purchased, and it is expected that tenders will be called for the new building within twenty days. The plans are now with the company's architects. As soon as possible the building will be commenced. In the meantime temporary quarters are being secured and manufacturing will start almost at once. Already the company has sufficient orders on hand to keep the London factory running full time for one year.

G. M. C. CURTAILS PRODUCTION

NEW YORK, Sept. 20—General Motors Corp. has entered upon a policy of careful merchandising which it considers important at a time as uncertain as the present. Output of its smaller models will be about 25 per cent and the executives of all its plants have been directed to make production conform rather closely to orders. The company does not expect its earnings for the last half to be as large as for the first six months of 1920 but the dividends undoubtedly will be entirely satisfactory to all the security holders in view of present financial conditions.

Allen Stockholders Advance New Funds

Plant to Resume Operations Under Agreement — Many Orders Reported Received

COLUMBUS, Sept. 18—The reorganization plan of the stockholders committee of the Allen Motor Co., of Columbus, was approved at a meeting of the stockholders, held in the Columbus Chamber of Commerce this week. Attending the meeting were more than 100 stockholders, representing a large majority of the stock. Samuel McClure, one of the committee, explained the plan, which includes the raising of \$500,000 among the stockholders, and the lifting of the receivership.

Creditors to the extent of \$1,400,000 have agreed to waive their claims for one year, while banks holding approximately \$500,000 of the company's paper have also agreed to the plan. A. F. Fain of New Straitsville, one of the principal objectors to the plan at a former meeting, reported a change of heart and his approval of the scheme. Reports show a large number of orders on the books and that dealers, anticipating the lifting of the receivership, are asking for cars.

James M. Butler, attorney for the trustees and committee, reported the skies brighter for the Allen Motor Co., than for several months. More than \$100,000 of the \$500,000 to be raised by stockholders was subscribed at the meeting.

Receiver to Operate Immel Body Plants

COLUMBUS, Sept. 21—R. H. Schryver, president of the Citizens' Trust & Savings Bank, has been named receiver for the Immel Co., which has been operating plants here. The company has been specializing in the manufacture of automobile bodies. The appointment was made by the court after the Immel Co. had confessed judgment on a note of \$10,000 given to C. W. Snider & Sons for labor and materials in the construction of the plant. Another claim for \$10,000 filed by a local lumber concern, in which a mechanic's lien was asked, was also filed.

The Immel Co. was reorganized some time ago from an old carriage building and painting concern called the John Immel & Sons Co. The company has \$1,000,000 preferred stock and 10,000 shares of no par value common stock, a large part of which has been sold. The new plant is almost completed and the metal work on the bodies is being done there. A part of the machine shop has also been set up. Allen F. Beck is president and general manager; Roger E. Allen, treasurer, and Miner P. Wilson, secretary. George Sunday, a son of William Sunday, the well-known evangelist, came to the plant some time

ago and was elected vice-president, but his resignation has been accepted. Sunday was unable to carry out the financial arrangements entered into by him.

Receiver Schryver is authorized to operate the plant and to push production. Reports show that the company has more than \$1,000,000 in contracts for closed bodies. A statement shows that assets are more than \$1,000,000 while liabilities are about \$275,000.

Mullins Body Lays Off Salem Plant Employees

YOUNGSTOWN, OHIO, Sept. 20—Suspension of shipments and lack of warehouse accommodations have caused reduction in the output of the Mullins Body Corp. at Salem, Ohio. More than 200 men were given indefinite leave of absence Sept. 15, which the company asserts is a temporary measure and that the layoff will be of short duration. The time, however, will be determined by the capacity of automobile manufacturers to accept shipment of bodies from the Mullins plant.

Inability of the motor car manufacturer to ship finished product rapidly enough is assigned as the reason for the motor car makers' incapacity to accept shipment of bodies. Operations by the Mullins plant will continue on a diminished scale until warehouse space is filled, but before it is necessary to make further reduction in output of bodies it is hoped that the motor car manufacturers will be in a position to accept bodies. Cancellation of orders is not one of the conditions causing the Mullins lay-off, officials of that company assert.

BOSCH ON 4½-DAY SCHEDULE

SPRINGFIELD, MASS., Sept. 20—Because of increasing depression in the automotive industry, the local plant of the American Bosch Magneto Corp. has gone on an indefinite weekly schedule of 4½ days. According to officials of the company, the action was taken in order to avoid the necessity of a large layoff of employees, and so as to keep the factory in at least partial operation. There have been persistent rumors of a large layoff of employees at the plant, but this has been positively denied by President Arthur T. Murray of the corporation.

SHIP 321,380 CARS IN QUARTER

WASHINGTON, Sept. 21—Summary of freight commodity statistics of Class One roads, as compiled by the Interstate Commerce Commission this week for the first quarter ended March 31, shows that 321,380 cars carried automobiles and automobile trucks with a total revenue freight of 2,490,167 tons. The movement of agricultural implements and vehicles other than automotive required 120,744 cars to haul, a total tonnage of 1,788,340. The heaviest loading of automotive equipment was in the Eastern district where 178,077 carloads carried a tonnage of 1,430,349.

Automobile Leader in Seattle Business

City Becomes Big Distributing Center—Alaska Develops as Motor Vehicle Field

SEATTLE, WASH., Sept. 20—Seattle's annual income from the automobile industry is \$72,093,000, and when the amount paid for oil and gas is added to this figure, Seattle and the trade territory it serves is spending in excess of \$100,000,000 a year for automobiles, accessories and fuel for these cars, according to a survey recently completed by the Seattle Chamber of Commerce and Commercial Club.

The automobile industry is revealed as the largest single branch of the city's commercial life.

During the last year Seattle alone purchased gasoline valued at \$18,870,000, while its oil for lubrication of motor-driven vehicles was worth \$2,780,000. More money was spent for gasoline and oil in the fiscal year ending June 30, 1920, than any previous year in the history of the city.

The survey shows that during the last year, in spite of some very unfavorable months experienced by the automobile trade due chiefly to the gasoline shortage, Seattle firms have gone into new territory, and that now Seattle is the distributing center and agency point for Oregon, Idaho, Montana, Washington and Alaska for the vast majority of all standard makes of cars, trucks and for accessory firms.

Seattle's prominence as a distributing center for motor-driven vehicles and machines will increase in tremendous fashion in the next five years, in the belief of local automobile dealers. Alaska has never been a heavy purchaser of automobiles, but during the last few years automobiles of the cheaper makes have been going into the territory until today the motor car is getting to be a common sight. When Alaska's purchasing status is improved by the opening up of the country, this side of Seattle's distributing system will gain tremendously, it is pointed out.

Tractors are coming to be an item of increasing importance in this section. With additional acreage requiring motor tractors in eastern Washington tractors are expected to show a marked increase in the immediate future.

The survey shows that Seattle firms last year manufactured \$1,150,000 worth of automobile parts.

G. M. ACCEPTANCE IN LONDON

NEW YORK, Sept. 21—The General Motors Acceptance Corp. has been granted permission by the State Banking Department to open a branch office in London. The expansion of this department of the General Motors Corp. to England probably is the outgrowth of the association with the corporation recently of prominent English and Canadian interests.

Commercial Credit Takes Over National

**Baltimore Company Will Add
Boston Business—To Increase
Capital \$700,000**

NEW YORK, Sept. 20—The Commercial Credit Co. of Baltimore has taken over the business of the National Acceptance Corp. of Boston but will assume none of the latter company's liabilities. Financing the sale of automobiles is the chief business of both. The stockholders of the Boston company will purchase about \$700,000 of new stock in the Commercial Credit Co., which will ask its stockholders to authorize a substantial capital increase as well as four additional directors to represent the new interests.

The directors who will be added to the board to represent the National Acceptance Corp. will be Louis K. Liggett, president of the United Drug Co. and a director of the National Shawmut Bank, Boston; W. Cameron Forbes, former governor general of the Philippines and a director of the First National Bank, Boston; F. Lothrop Ames, a director of the Old Colony Trust Co., Boston, and Charles B. Wiggin of New York, a member of Bond & Goodwin, investment bankers.

With its additional capital the total cash, capital, surplus and undivided profits of the Commercial Credit Co. and its subsidiaries, the Commercial Acceptance Trust, Chicago, and the Commercial Credit Co., Inc., New Orleans, will be about \$6,700,000. After providing for estimates of Federal taxes for 1921 the combined surplus applicable to the common stock of the Commercial Credit Co. is in excess of \$1,300,000.

EAST IRON RECEIVER NAMED

LIMA, OHIO, Sept. 20—C. C. Mosher, vice-president of the East Iron & Machine Co., manufacturers of differential gears, has been appointed receiver of the corporation by the Federal court. Operations will be continued pending the completion of refinancing plans. The troubles of the company are attributed to lack of working capital to handle expanding business. Cash available has been depleted to meet deferred liabilities. Receiver's certificates will be issued to finance current operations. Present financial conditions are held responsible for delay in refinancing. The receivership petition was filed by the Bass Foundry & Machine Co.

HUFFMAN TO ANSWER CHARGES

OMAHA, Sept. 21—Counsel for the Huffman Motors Co. to-day filed special appearance in reply to the suit of Andrew K. Nelson, et al., against the company and the officials thereof in which the plaintiffs demand a receivership and accounting, charging conspiracy to defraud. The status of the case thus becomes that the defendants are prepared

to come into court on motion of the plaintiffs and at a date to be set by the court on petition of the plaintiffs, to argue a special motion, which in this case is intimated to be a question as to the jurisdiction of the court.

Counsel for the defendants declared when the original petition was filed that the Nebraska District Court had no jurisdiction because the defendant company is incorporated under the laws of Delaware, and its plant for manufacturing automobile trucks and passenger cars is located at Elkhart, Ind. The plaintiffs have not as yet asked the court to set a date for hearing.

First Branch Opened of New Motor Service

BOSTON, Sept. 21—The National Chain Motor Service Corp. which was organized several months ago to establish a national chain of repair shops over the country, opened its first link at 128 Cambridge Street, Charlestown, Saturday.

The opening was made the occasion of a house warming for the stockholders and directors of the organization. John C. Speirs, formerly general manager of the Autocar company, now president of the service corporation, met the guests and took them on a tour of inspection over the shop.

The company's first service station has a floor area of 24,000 feet on two floors and is a modern brick and cement fire-proof construction, having been built under the personal supervision of one of New England's foremost architects specializing in garages. The building is in the very heart of the heavy trucking district and well located to obtain a volume of local business from the many important factories which surround it.

LA POINT BUYS VIM PLANT

MILWAUKEE, Sept. 20—The LaPoint Foundry Co. of Schleisingsville, Wis., has purchased the former plant of the Vim Tractor Co., now in its new works, and will increase its floor space by 13,750 sq. ft., or nearly four times the former capacity. The building is 50 x 275 ft. The name of the LaPoint company has been changed to the Rex Foundry Co. Robert LaPoint, formerly president, retired a year ago. The present officers are: President, Frank P. Burke; vice-president, J. J. Cramer; secretary and treasurer, F. F. Kegel. The business was established in 1916 in connection with the Standard Machinery Co. at Schleisingsville, which formed the nucleus of the Vim Tractor Co.

WARNS ON PATENT FUELS

WASHINGTON, Sept. 18—Warning against the purchase of patent motor fuels and other products advertised as having been tested and approved by the Bureau of Mines was given in a statement issued to-day by that bureau. In several instances, the warning said, companies had so advertised products of very different compositions from those submitted to the bureau for test.

Akron Population Drops Off 50,000

**Cleveland Bank Places Figures
—Finds Automobile Manufac-
turing No Longer Novelty**

YOUNGSTOWN, Sept. 20—The Cleveland Trust Co., in a general review of the business situation, in an official bulletin made public to-day, gives figures showing that the slump in the rubber industry has cut heavily into the population of Akron. The statement says:

"Official estimates at Akron place the population slump there in recent months at 50,000. Of this total 35,000 were wage earners and 15,000 dependents.

"Automobile plants generally have postponed expansion programs," the statement continues. "Automobile manufacturing has definitely emerged from the novelty stage and is now a stable industry and is recognized as such by leading financiers. Paradoxical as it may seem a feeling of optimism is in order as the downward readjustment gains momentum. Completion of deflation should find easier money and prices on a level more conducive to buying than at present."

Akron Counts Labor, Sees Trade Return

AKRON, Sept. 21—It was revealed here during the past week that the "Big Four" tire companies are already preparing for an early resumption of business and in some quarters it is felt that the former idea that the general resumption would not be experienced until spring may be anticipated by meeting with the return of business before then. Agents of the labor bureaus of the concerns are already at work taking a census of the skilled mechanics and laborers in Akron and vicinity with a view of being able to locate them at short notice.

The census is being conducted very quietly but nevertheless is being done systematically and thoroughly. Particular attention is being paid to skilled men in the building and machine trades and the general impression here is to the effect that immediately after the election in November a change will be noted and business will at once begin to resume.

S. A. E. TO HEAR WHEEL TALKS

DETROIT, Sept. 20—The Detroit section of the Society of Automotive Engineers will open its season with a meeting to be held at Hotel Statler on Sept. 24. The subject will be on "Recent Developments in the Design and Manufacture of Passenger Car Wheels," the speakers being C. C. Carlton of the Motor Wheel Corp., whose topic will be "Wooden Wheels"; F. M. Germane of the Standard Steel & Bearing, Inc., whose subject will be "Wire Wheels," and A. L. Putnam of the Detroit Pressed Steel Co., who will speak on "Disk Wheels."

New Orleans Enjoys Best Tractor Year

Many Fleets Now in Operation
on Plantations—Farmers Be-
come Firm Believers

NEW ORLEANS, Sept. 20—Tractor dealers, now preparing for heavy sales during the spring rice, cane and corn planting, have had the best season for sales they ever have had in Louisiana and Mississippi, according to virtually unanimous opinion of all these dealers in New Orleans.

"The practical farmers have learned this year as never before how great an aid the tractor is to farming; they have found that there is a tractor for every purpose; they are beginning to give the tractor proposition, when it is put up to them, the most serious consideration, and the result is that where one tractor was sold out of New Orleans last year, ten to fifteen were sold this year."

This is the crystallized sentiment, succinctly expressed, of the dealers of New Orleans. Some of the tractor fleets which have been put out of New Orleans in the past fifteen months are doing work like this:

The Cuyamel Fruit Co. of New Orleans is operating a fleet of seven tractors in Honduras, getting large mahogany logs out of the swamps.

The Robert J. Godchaux Co., Inc., of New Orleans, is using 20 tractors on its six sugar cane plantations in Louisiana.

W. P. Mathews is using 17 on his sugar cane plantations.

Besides regular farm work, a number of the smaller towns and cities of Louisiana and Mississippi are using tractors for street and road building and repair. Among these are Biloxi, Poplarville, Meridian and Jackson, Miss., and Lafayette, Lake Charles, Shreveport, Baton Rouge and Alexandria, La.

Only within the past year or so has it been possible for the cane planters to obtain a tractor which would work their cane through planting, cultivation, harvesting and transportation to plantation mills, but they can now get these adaptable tractors, and their use is increasing rapidly. Louisiana planters have demonstrated that 15 to 16 acres a day is the best limit for the tractor, though as high as 21 acres have been cultivated.

A law passed by the last Louisiana legislature compels all tractor dealers in the state to carry a complete line of parts and equipment for the makes of tractors they sell. This has put several small dealers out of business in rural communities, through lack of capital.

FLINT MENACED BY ROADS

FLINT, MICH., Sept. 20—Industrial leaders and business men of Flint at a meeting here this week voiced vigorous protest against road conditions in the county, which practically have isolated this city. It was declared in the meeting Flint factories, particularly automobile plants, might have to shut down because

of the inability to move cars, automobiles and trucks to and from the factories on account of the bad roads. It was declared the near approach of winter made it almost impossible to get roads in condition for transport before bad weather sets in preventing further efforts at road construction. State and county road officials were called upon to act immediately in the effort to relieve conditions which threatened the loss of millions and the unemployment of thousands of working men.

Plan Car Assembly in Central Europe

NEW YORK, Sept. 20—Walter Kellner, a manufacturer of machinery with plants at Barmen and Detwold, Germany, is in the United States in the hope of making contracts with several American manufacturers to sell their products in Central Europe and the Balkans. He believes a large market can be developed in these countries for American automobiles and farm tractors provided the machines are assembled in Germany so they can enter into competition with European manufactures.

Kellner, who has letters of introduction to American bankers from the Barmen Bank Verein, is at the head of the Kellner United Industries, which embraces five large concerns employing about 3000 persons. The machinery produced is chiefly for industrial and agricultural purposes. It would be his purpose to assemble American products at his own plant, accepting them either finished or partly finished. Kellner's headquarters in New York are with Roselius & Co., 31 Union Square West.

FORD FORMS LUMBER COMPANY

IRON MOUNTAIN, MICH., Sept. 20—The Michigan Iron, Land & Lumber Co., headed by Henry Ford, has been organized with a capital of \$2,000,000 to conduct the saw mill and body plant to be operated on the 400,000 acre tract purchased by Ford some time ago.

Besides Henry Ford, officers of the company are: E. G. Kingsford, vice-president and assistant treasurer; C. B. Longley, secretary, and Edsel Ford, treasurer.

In addition to the plants for body manufacturing and saw mill and logging operations the company has let contracts for an office building and 50 modern dwelling houses to be erected for the use of company employees.

DAFOE RECEIVERSHIP APPOINTED

DETROIT, Sept. 20—B. J. Lincoln was named receiver for the Dafoe-Eustice Co. of this city by Federal Judge Tuttle. Application for the receiver was made by attorneys for the Campbell-Edwald Co., advertising; Lowrie-Robinson Lumber Co. and the Stubbs Co.

The creditors above named recently filed a joint petition in bankruptcy against the concern. The company manufactures automobile tops, sails and canvas goods.

South Africa Shows Desire for Tractor

Moderate Priced Machines Would
Find Buyers—Garages Equip-
ped for Service

JOHANNESBURG, Aug. 12 (*Special Correspondence*)—Factory representatives who have been sent to the Union of South Africa by farm tractor manufacturers have generally erred in endeavoring to place the representation for these tractors through the agricultural machinery trade instead of through the motor car trade. It is rather natural that the tractor manufacturers should go to the agricultural machinery trade, but the agricultural machinery business in the Union of South Africa is entirely in the hands of the larger jobbing firms doing a general business in groceries, hardware, etc., and they give no service in repairs.

They also have so many diverse interests that they cannot give it the special attention it deserves. It is the garageman who has gone through the experience of the early days in automobiles with the snags to be faced, the discouragement to be met, and the conservatism to be overcome and who, knowing that the results in automobiles more than justified his venture, is best able to tackle the tractor job and make a success of it. This garageman also has the equipment necessary to give the required service and the skilled labor to make the service a success.

William Campbell, manufacturers' representative of this city, thinks the garageman by far the best man for handling the tractor. The motor truck business is already in the hands of the motor car dealer and the garageman who has the initiative and ambition to make a success of the tractor business. Interest in tractors is keen at the present time in the Union of South Africa. Conditions of soil are different here as compared with the United States. The tractor required for South Africa is a moderate priced sturdy machine.

The Union of South Africa is a land of great distances and great areas. Rhodesia, for example, is a big territory large enough to embrace all of France, Italy and Germany within its borders and yet it has but 36,000 white population. It is a two-day continuous land journey from Johannesburg to Salisbury, a town of 3500 population in Rhodesia. The fact that the Union of South Africa is a land of great areas, makes it especially attractive for motor apparatus of all kinds.

WOOD WINS BOAT CUP

DETROIT, Sept. 20—The gold challenge cup of the American Powerboat Association was won here yesterday by Gar Wood with his *Miss America*, which established a new world's record of 71.43 miles an hour when it took the final 30-mile heat of the race in 25 minutes, 37 2/5 seconds.

Bankers "Pass Buck," Harding Says

Take Easiest Way in Refusing Loans

Tell Credit Seekers of Mythical Federal Reserve Board Pronunciamento

(Continued from page 603)

posit, and they never know when the thing is going to return to a large deposit account again. So that the primary purpose of nearly all banks in declining loans is to avoid giving any offense. Well, now, I have no doubt, we all know that under present conditions we have a lender's market rather than a borrower's market. Banks have no trouble in keeping their funds employed. They probably have a dozen applications for loans to every one that they really wish to grant, and I know in some cases, because I have traced it down, that where a bank receives an application for a loan which it has no intention of granting, they follow the lines of least resistance; something goes on about like this: They will say to this customer who comes in and wants accommodation:

"Well, Bill, old man, I would like the best in the world to accommodate you. You have kept a good account with us in times past, and I would like the best in the world to accommodate you, but you know the Federal Reserve Board won't let us."

"That is a very easy way of 'passing the buck,' but it is hardly fair to the Federal Reserve Board. I find it has caused me a great deal of extra work in receiving and sending telegrams and letters, asking why about it, and I want it distinctly understood right now that the Federal Reserve Board has never attempted to go beyond its lawful powers which are clearly defined in about forty pages, known as the Federal Reserve Act. We have not undertaken to dictate to any bank what loans it shall make or what it shall not make. We have merely suggested as our policy in the best interest of the various communities in this country that each bank should exercise its judgment and support more particularly the local industries which were dependent upon it, which have no general credit, and that if they have got to limit their loans, that they discriminate in favor of those particular essential industries which in their judgment are essential, and which are necessary for the support and upbuilding of the community in which the bank is located."

The scandalmongers of the industry were given a severe rebuke at the convention. They were held responsible for many of the false reports of disaster

which have been given wide circulation and which have worked serious harm. The psychological effect of these evil reports upon the general public has resulted in the general impression that the industry is in much worse condition than it really is.

More important than the rebuke of tale-bearers within the ranks, however, was the action taken by General Counsel Meyers in calling upon the Department of Justice at Washington to bring to book a ring of Wall Street gamblers who, according to information Meyers has obtained, are deliberately fostering reports of receiverships and financial difficulties so that they may depress the stocks of the companies involved and sell short at a profit. It undoubtedly is true that these unscrupulous speculators have traded heavily in the stocks of passenger car and truck companies, profiting materially in consequence.

The credit department of the association will keep a sharp lookout for these pirates and any evidence obtained will be turned over to Meyers who will see that legal action is brought against them, for dissemination of such false information is a double barreled offense against the law.

Credit men were warned to be on their guard against reports of disaster and to accept as true only those which stand up after careful investigation. Propagation of such tales may involve in serious consequences a company which otherwise would be able to pull through its difficulties.

This danger was stressed by M. L. Heminway, general manager of the association, in his annual report. It creates disturbance of mind, he said, and has a bad effect. Present disturbances are transient, he pointed out, adding that as long as there is a transportation problem in the world the wheels of the automotive industry cannot be stopped. The ineffectives are being weeded out, he said, and business must be conducted along sane lines. Never was the question of credit more important than it is now.

C. A. Burrell, manager of the Credit Department, reviewed the work which has been done in the past twelve months and strongly urged every member of the association to co-operate in every possible way with the activities of a branch of the organization which has saved many thousands of dollars and may save them many thousands more if all of them pull together.

Edward S. Jordan appeared before the convention as the representative of the car manufacturers and drove home in a snappy way an optimistic address which brought frequent applause. He declared the only thing the matter with the industry is that men in it are reluctant to

Speakers Rebuke Scandalmongers

Heminway and Others Warn of Evil Results—Will Watch Speculators

take off their coats and go to work after a long period during which money rolled into their strong boxes without any appreciable effort on their part. The most important task before every man in every branch of the industry, he declared, is to preach the gospel of good roads every day in the year until the country is awakened to the fact there never can be 100 per cent efficiency in transportation until highways are provided to carry the trucks and passenger cars which are doing so much to keep commerce moving. Every manufacturer and every dealer, he said, is making and selling transportation and they must keep hammering away to convince the skeptics who are left that this is true.

Speaking from the viewpoint of the raw material producer, Joseph Pendleton of the Carpenter Steel Co., declared that if everyone in the industry will keep his head and help the other fellow, the troublesome situation will be cleared up within two or three months. In the interim business will be quiet. Most of the present day trouble he attributed to overexpansion and failure of the men in business to keep their assets liquid in preparation for an emergency which they ought to have seen coming. Many of them were more eager, he said, for large immediate profits than to build on a basis which would bring sure and substantial returns for the future.

Use and abuse of the trade acceptance was discussed by R. E. Hayslett, treasurer of the Hydraulic Steel Co. of Cleveland. His assertion that they were a most valuable trade instrument when they were not used in payment of past due accounts, which is specifically forbidden by the Federal Reserve Board, was accepted as true in the discussion which followed. Members of the association were asked neither to issue nor accept trade acceptances in payment for accounts which have passed maturity.

TO MAKE NEW DIFFERENTIAL

MILWAUKEE, Sept. 20—Articles of incorporation have been filed in behalf of the Master Self-Locking Differential Mfg. Co., with temporary headquarters at Neenah, Wis. It is capitalized at \$250,000 and will engage in the manufacture of a patented device which provides for the application of power to all wheels of a motor truck or tractor, which has been perfected by Benjamin Kosheboski, of Clintonville, Wis.

Ford Action Studied by Industry

Big Output Made Reduction Possible

National Automobile Chamber
Says 4000 a Day Production
Presaged Cut

(Continued from page 636)

exceeded 300,000, and the factory was able to produce that number, to return a bonus check to each Ford owner of between \$40 and \$60. The plan worked so well and the owners boosted the car so that the figure was far exceeded and the checks were returned, \$50 to each purchaser since the beginning of the fiscal year. The prices were then dropped \$50 for the following year, and later to the low levels of 1916.

Ford's plan throughout has been to constantly increase production and reduce the factory profit on each car. The tremendous number of new prospects reached through each price reduction more than swells the total profits of the factory. At one time, less than two years ago, the factory profit on each car was \$21.

New York Interest Deep

NEW YORK, Sept. 21—Announcement of price reductions by Henry Ford was received with intense interest in all branches of the industry in New York. When informed by AUTOMOTIVE INDUSTRIES of the action taken by the Detroit manufacturer, the National Automobile Chamber of Commerce said it was not in a position to comment on the radical step. It was not entirely unexpected, however, for the intimation was given several days ago that a Ford production of 4000 cars a day probably presaged a price cut.

Officers of the Chevrolet Motor Co. declined to intimate in any way whether that corporation would meet the Ford reductions, although their car ranks next in the price classification. It was said several days must elapse before any comment could be made.

The chief interest here was in what effect the stand of Ford would have on other manufacturers. Possibility of lower car prices has been a much discussed question for several weeks but it has been the contention of all the manufacturers that reductions were impossible until costs of production went down. The same stand has been taken by the larger tire manufacturers. Several of the smaller tire companies have cut their prices, however, and the same has been true of a considerable number of parts makers.

Economists have contended all along

that normal conditions could not be restored until the price level of all commodities came down. The trend of other commodities for the past few weeks has been steadily downward. This has been hailed as a most encouraging indication of a readjustment from post-war inflation.

FEAR EFFECT ON PUBLIC

CHICAGO, Sept. 22—While the action of Ford in scaling down his prices undoubtedly will increase the demand for his cars it is felt here that it will be a bad thing for the industry. The widespread publicity which has been given it is expected to retard the sales of other makes, as prospects will be inclined to hold off in the expectation that other manufacturers will announce price cuts.

NO BEARING ON BUICK

FLINT, MICH., Sept. 22—E. T. Strong, general sales manager of the Buick Motor Co., said to-day that when Ford has advanced his prices in the past it has had no bearing on the Buick line.

"Reduction in Ford prices now," he added, "should have no bearing on other lines which have improved distinctly in design, workmanship and material during the last three years."

GENERAL CUT NOT LIKELY

CLEVELAND, Sept. 22—Reduction in Ford prices probably will not be followed by other companies in the opinion of E. S. Jordan of the Jordan Co., and Charles W. Mears of Winton. Jordan said the Ford company had the advantage of a large output and of an appeal to a certain clientele.

NORTHWEST SALES DELAYED

MINNEAPOLIS, Sept. 23—Dealers in Ford cars noted increased sales within 24 hours after the announcement of price reductions. Other dealers are reticent on the subject although the outlook is for continued dullness in the low and middle priced cars, owing to the prevailing impression among prospective buyers that other manufacturers will follow Ford's lead. It is not generally admitted, but dealers in the Northwest have many paper orders which probably will not develop into sales under present conditions.

The tendency of farmers to hold their products for increased prices has checked rural sales, some distributors reporting little or no business at country fairs. Used car dealers are cutting their prices. The situation generally is one of watchful waiting with the more optimistic dealers expecting better conditions within six months as the result of the Ford move.

Factory Officials Withhold Comment

Concede Small Car Makers Most
Affected—Believe Sales Will
Be Delayed

DETROIT, Sept. 22—None of the automobile manufacturers in the Detroit district are willing to go on record as believing the Ford price cut will have any effect upon the selling price of other cars. It is conceded, however, that the first effect will be felt by the lower priced cars. It is considered possible reductions will be announced by one or two in the near future.

Protracted conferences of department heads at all factories in the Detroit district were called as soon as the news of Ford's action was received. Clarence Earl, vice-president of the Willys-Overland, had nothing to say. Efforts to get in touch with General Manager Haynes of Dodge and his assistants disclosed that they were in conference discussing the situation.

Affairs at the Maxwell and Chalmers plants are so upset that none of the few officials on duty would venture a statement as to the effect on prices. Chevrolet officials referred inquiries to the General Motors offices in New York.

Manufacturers of the higher priced cars laughed at the suggestion that Ford's action would have any effect on them. They admitted, however, that the general trend of prices was downward. They declared lower prices would be announced just as soon as the cost of production would permit.

MUST USE UP INVENTORIES

INDIANAPOLIS, Sept. 23—It is impossible at this time to obtain definite statements from Indianapolis automobile manufacturers concerning future prices. The general impression prevails here, however, that reductions are inevitable but that they cannot come until present inventories, bought at high prices, are worked up and production costs are lowered.

NASH SAYS CUT IMPOSSIBLE

KENOSHA, WIS., Sept. 23—The following statement in regard to the action of Ford in cutting prices was made by C. W. Nash of the Nash Motors Co.:

"Our company plans no reduction on our product. It is absolutely impossible as there has been no reduction whatever in labor and no reduction by staple companies in prices of steels and other materials. Ford reductions in price unquestionably will have some effect in influencing buyers to hold off.

Army's Air Service Builds Flying Fort

New Armored Triplane Carries 14 Machine Guns, Cannon and Torpedo

NEW YORK, Sept. 21—A new armored triplane, known as the G. A. X., which is a veritable flying fort, has been developed by the Army Air Service. The armor is of $\frac{3}{8}$ -in. steel. It covers three-quarters of the fuselage, all mechanical parts and controls as well as the two nacelles, one of which is on each side of the fuselage.

The plane is powered by two Liberty motors of 400 hp., one in each nacelle. The engine is of the pusher type. The fuselage, which is about 5 ft. wide, provides plenty of room for pilot and observer to move about.

The plane carries a 37 mm. (1-lb. shell) cannon in front with two machine guns which fire automatically while the cannon is being aimed. Underneath the cannon are 3 Lewis machine guns in a row, 3 in a line with the pilot in front, 3 in the rear of the pilot for action on the rear, and 3 mounted on a movable platform under the observer. This makes a total of 14 machine guns and a 1-lb. automatic cannon. Slung underneath the fuselage the plane also carries a Whitehead torpedo, containing 200 lb. of trinitrotoluol, which can be aimed and dropped on land or sea. All the machine guns can be fired simultaneously.

The plane makes a speed of 110 miles an hour with its present power plant. It is understood, however, that it is largely underpowered and that with motors which now are being built, it can develop a speed of 175 miles an hour.

The Army Air Service also is developing the Lepere armored triplane, which is armored similarly to the G. A. X. It is a 2-seater which carries eight machine guns and a 1-lb. cannon. It is powered by a Liberty engine.

Considerable attention is being devoted to the development of a new type of motor suitable for the armored planes.

Franklin Prices Drop 20 to 30 Per Cent

SYRACUSE, Sept. 23—The H. H. Franklin Mfg. Co. to-day announced sharp reductions in the prices of its cars. The new and old lists follow:

	Old	New
Touring car	\$3,100	\$2,600
4-passenger	3,100	2,500
2-passenger	3,050	2,400
5-dan	4,350	3,600
Brougham	4,300	3,500
2-passenger enclosed	3,300	2,750

CHRYSLER SEEKS DECISION

NEW YORK, Sept. 23—Another meeting of all the Maxwell-Chalmers interests is being held this afternoon and considerable confidence is felt that a final decision will be reached. Walter P. Chrysler, chairman of the committee of management appointed at the insistence of the banks, will preside. It is understood that the \$15,000,000 of new capital

which was to be raised, largely among the stockholders of the two companies, by the purchase of securities in a new corporation, has been virtually all subscribed. Announcement is expected very soon of the details of the reorganization and refinancing plans together with a statement concerning the personnel which will conduct the affairs of the company under the general direction of Chrysler and J. R. Harbeck, vice-president of the American Can Co.

Ford Balance Sheet Shows 1920 Increases

BOSTON, Sept. 20—The balance sheet of the Ford Motor Co., filed with the Secretary of State, shows the following as of June 30 compared with the same date last year:

Assets—	1920	1919
Real estate	\$85,549,726	\$54,975,641
Mach. and equip.	41,661,136	24,212,779
Mch. mat., stock in process	96,069,908	76,400,046
Cash and debts rec.	62,499,026	156,011,982
Patent rights	77,858	
Bonds	18,921,608	20,903,011
Stock in sub. cos.	1,126,742	
Exp. invent.	789,102	498,259
Total	\$306,695,109	\$332,998,121
Liabilities—		
Capital stock	\$17,264,000	\$2,000,000
Accts. pay.	15,958,115	24,097,321
Notes pay.	35,112,973	
Accrd. sal. and wages	3,363,498	
Floating debt		72,174,637
Depr. res.	18,654,489	
Res. for int., taxes, etc.	49,163,974	
Accrd. exp.	1,498,424	7,139,579
Profit and loss	165,679,132	73,655,435
Surplus		153,931,146
Total	\$306,695,109	\$332,998,121

New Grade of Buyer Reached by Ford Cut

SAN FRANCISCO, CAL., Sept. 22—Nothing that has occurred in automotive circles this year has caused anything like the impression in San Francisco and throughout the entire Pacific Coast region that resulted from the announcement of the cut in Ford prices. Ford dealers, most of whom are out of cars at the present time, are enthusiastic and predict from 100 to 200 per cent increase in Ford business.

Undoubtedly this increase, whether it attains the dimensions predicted or not, will have some effect on the sale of other makes of cars, particularly of the three or four makes closest to the Ford figure. The entire motor car purchasing public appears to be holding off for a few days to see if other manufacturers will follow suit with price reductions.

In the case of the lower-price car distributors, the attitude is taken that a large percentage of the new Ford business will be from a new field of purchasers—one that could have been reached at the present time in no other way, and that for this reason less difference will result than would appear possible at first glance.

Distributors of high-grade cars declare that the Ford announcement will have no permanent effect on their business. They do not expect any price reductions in the high-grade car field.

Government Probes Tire Price Raises

Anti-Trust Section of Department of Justice Investigates Unity of Action

WASHINGTON, Sept. 23—An investigation to determine whether the leading tire manufacturers of the country have conspired to increase the price of their commodity, in violation of the Clayton act, the food control law and other war time legislation, is being conducted by the Department of Justice. This fact became known to-day although it was emphatically denied several weeks ago when information to the same effect reached AUTOMOTIVE INDUSTRIES.

The inquiry is being carried on by the anti-trust machinery of the department under the direction of Judge Ames. In connection with it reference was made to "the recent increase in the price of practically every leading automobile tire on the market," although so far as known there has been no general increase in tire prices for more than six months. In many instances retailers who have been heavily stocked with a falling demand have sold tires at less than list prices to clear their shelves.

The Federal Grand Jury in Washington has been asked to investigate tire prices in this city and to make a careful survey to determine whether there has been collusion between manufacturers in relation to price advances.

To Recommend Changes in Rail Class Rates

NEW YORK, Sept. 23—James S. Marvin, traffic manager of the National Automobile Chamber of Commerce, has sent to members a bulletin in which he analyzes the proposed report of Examiner Disque to the Interstate Commerce Commission on the trans-continental rate case. The report holds that carriers should establish more reasonable class rates. If the scale he suggests is adopted the cancellation of commodity rates on a number of articles, including automobiles and trucks, would be approved by the N. A. C. C. largely on the ground that these articles move under class rates in all other territories. The cancellation of commodity rates on trucks would be approved, however, only in the event that carriers apply the proposed second class rates in carloads.

The principal changes would occur in the 40-ft. car minimum to California and the 50-ft. car minimum both to California and the North coast. As Pacific coast shipments usually are heavily loaded the changes in 40 ft. car minimum may not be important but the 50 ft. car minimum would make the use of such cars for some shipments seem prohibitive.

The proposed report is having the attention of the traffic department and its attorney, for exceptions must be filed not later than Sept. 30.

Highway Transport Looms Into Form

Unity of Interest Shown at Committee Meeting Monday—To Name Executive

WASHINGTON, Sept. 22—Co-ordinated effort on the part of scientists, engineers, educators and students to establish and promote principles of highway economics and transport assumed tangible proportions here to-day when assurances were given that the National Research Council would soon commit itself definitely to a plan furthering the co-operative movement. The meeting of the Permanent Highway and Highway Transport Committee, held Monday, presented unmistakable evidence that the development of the spirit of unity between the automotive industry, highway engineering, government bureaus and scientific bodies would effectively dissolve opposition and bring about a rightful recognition of the importance of highway and highway transportation problems.

The immediate and outstanding feature of the committee meeting was the recommendation of the Ways and Means Committee, consisting of Dean Bishop of University of Pittsburgh, chairman; Roy Chapin, representing Pyke Johnson as alternate for the National Automobile Chamber of Commerce, and Thomas H. MacDonald, chief of the Bureau of Public Roads. The appointment of an experienced executive at a salary ranging from \$7,000 to \$10,000 a year was urged by the committee. It was suggested that this official should have an intimate knowledge of the problems of the automotive industry and highway transport. It was made known to-day that only two men were under consideration for the post. It is further proposed that a budget of \$25,000 be authorized for the operation of the administration work necessary for the plan.

It has been recommended that the administration force be maintained for a period of at least five years. It is expected that the work will become so firmly fixed by the expiration of the five-year period that the future will take care of itself. The National Automobile Chamber of Commerce has under consideration the proposal to contribute \$10,000 for the promotion of the enterprise.

The report of the Ways and Means Committee as presented by Dean Bishop tentatively suggested that the administration officers be charged with the duty of compiling data relating to highway transport into unified and synthetic shape and distribute the material to schools, colleges and other places where it will serve its purpose.

SUPREME MOTORS BUYS LAND

CLEVELAND, Sept. 21—Announcements of several important expansions in the automobile industry here were announced last week.

Charles H. Davies, founder of the Supreme Motors Corp. at Warren, announced that the Globe Motor Co., a new corporation, has purchased a large tract of land in Euclid village on which an assembly plant containing 40,000 feet will be the first unit of an engine plant to cover 180,000 feet.

The Globe Motors Co. will manufacture a small car of conservative design and demonstration will be made within 90 days. The Supreme engine will be used in the new car.

Mr. Davies is president of the new company; W. E. Tellings, vice-president; F. W. Staffield, secretary, is vice-president of the State Banking & Trust Co., and L. E. Holmden, treasurer, is vice-president of the Guardian Savings & Trust Co.

Bankers Find Cars Aid Banking Business

NEW YORK, Sept. 21—Paradoxical as it may seem, the bankers of the country, some of whom have classed passenger automobiles as luxuries, have increased the profits of their business 33 per cent by the use of motor cars. Financiers in rural districts admit that the automobile has made possible more loans, better inspection of properties and a sounder acquaintance with their clients. Many of them estimate the increased volume of business due to motor travel at more than 50 per cent, and some of them place it at several hundred per cent.

These statements are based on replies to thousands of question cards sent to car owners in 10 States by the National Automobile Chamber of Commerce.

Returns from urban sections show that while the bankers use the automobile comparatively little for business, nearly 34 per cent have improved their living conditions by the use of motor cars.

Franklin Sales Grow 88 Per Cent in Year

SYRACUSE, N. Y., Sept. 21—Business done by the H. H. Franklin Mfg. Co. for the year ended Aug. 31, 1920, amounted to \$31,001,565.25; an increase over the previous year's prices of \$14,561,934.92, or 88 per cent. Foreign sales showed an increase of 166 per cent over the previous year.

The popularity of the enclosed car is reflected by the report that sales of the sedan type alone totaled 3181 cars. It is expected that 75 per cent of the production of Franklin cars for the coming year will be sedan and brougham type.

Additions to the Franklin plant costing about \$1,000,000 will be ready for occupancy by the first of the year. Production in the greater Franklin factories will be about 75 cars a day.

FORD ASKS POWER GRANT

WASHINGTON, Sept. 18—The Ford Motor Co. has asked the Federal power commission for a license under the new water power act to construct a project on the Hudson river at Troy, N. Y.

Engineer to Study Snow Removal Needs

Bureau of Public Roads Meets N. A. C. C. Suggestion—Want Driveaways Kept Open

WASHINGTON, Sept. 21—As the result of a conference with representatives of the National Automobile Chamber of Commerce, officials of the Bureau of Public Roads have arranged to send an engineer through the lake district and other congested sections to make a survey of snow removal requirements, both from the standpoint of automobile driveaways and from that of the general use of highways in winter. The co-operation of the N. A. C. C. has been pledged by J. S. Marvin, manager of the Traffic Bureau.

J. L. Harrison, chief highway engineer of the Bureau of Roads, has been designated to make this report, and traffic managers of the automobile industry have been invited to confer with him at the Hotel Statler, Cleveland, Friday. Subsequent meetings will be held at Toledo, Sept. 25; Indianapolis, Sept. 27; Detroit, Sept. 28, and Milwaukee, Oct. 2. Harrison will be accompanied on his trip by K. A. Moore, assistant traffic manager of the N. A. C. C.

Traffic managers are urged to take with them to the meetings data which will show what roads are most important and carry the heaviest burden of driveaways. In connection with the snow removal campaign, it is pointed out that the active administrative power is lodged with the States and counties, but the survey will give them specific information regarding the problem.

S. A. E. Assigns Dates for Winter Meetings

NEW YORK, Sept. 21—Three important meetings of the Society of Automotive Engineers have been set for the winter months. The first of these will be the motor boat meeting on Dec. 14 at the Automobile Club of America which will include a professional session and dinner.

The annual meeting of the society will be held Jan. 11 to 13 inclusive. The standards meeting will be on Tuesday, business and simultaneous professional sessions on Wednesday morning, two simultaneous professional sessions on Wednesday afternoon, and fuel and research, Thursday morning and afternoon. The fuel sessions will include papers on the following sub-divisions:

- (a) Chemical and Physical Phenomena,
- (b) Related Mechanical Features in power plant design, and
- (c) Chassis Design and Its Relation to Fuel Economy.

The Chicago truck and tractor meeting will be held Feb. 2, at the Morrison Hotel, with a professional session in the morning and afternoon and dinner in the evening. The Columbus tractor dinner will be held Feb. 10.

INDUSTRIAL NOTES

Automobile Life Tire Chain Co., which recently was organized with \$50,000 capital by O. E. F. Hoya, Milwaukee, has awarded contracts for the erection of the first unit of its permanent plant at Cedarburg, Wis. It will be 40 x 120 ft., and be equipped for making non-skid tire chains for passenger and commercial cars and other safety devices and appliances for motor vehicles. Production will begin about Oct. 15 or Nov. 1.

Continental Motors Corp. is adding facilities for three extra boilers at its Detroit plant, an air compressor set and a Corliss generating set, to provide an increase in power for the big additions to the plant now under construction. The west wing is being extended for the manufacture of spare parts. Special efforts are being made by the company to improve the efficiency of its spare parts service.

Willard Storage Battery Co. has bought property adjoining the Grand Trunk tracks in Toronto from the Wilkinson Plow Works for \$70,000. The company will start at once a first unit of a series of buildings for the manufacture of its batteries in Canada.

Hobart Bros. Co., Troy, Ohio, have added a line of general purpose ball-bearing electric motors to their products in electrical specialty manufacturing. The line will consist of motors of 1, 2, 3, 5, 7½ and 10 hp. for both alternating and direct current.

Shaw Mfg. Co., Lynn, Mass., would like to receive catalogs of automatic machinery, turret lathes, drill presses, and machinery suitable for manufacturing small metal products.

Hood Motor Truck is to be manufactured by a company which plans the erection of a factory at Monroe, Mich. The company is incorporated for \$500,000.

Toro Motor Co., Minneapolis, has amended its charter changing its business name to the Toro Mfg. Co. There is no change in the officers or personnel.

Tokheim Oil Tank & Pump Co., Fort Wayne, Ind., has increased its property holdings from 3½ to 8 acres. Business for the year has reached \$2,000,000.

Connell-Erben Body Corp., Clark's Summit, Pa., has changed its name to the Lackawanna Body Corp., under which it will continue to do business as formerly.

Gaston, Williams & Wigmore, Inc., New York, exporters and importers, has moved from 39 Broadway to 100 West Forty-first Street.

Hawkeye Truck Co. has received an order approximating \$80,000 from Richards, Thyme & Co., London, for immediate delivery.

Parker Motor Truck Co., Milwaukee, has issued a new catalog showing all changes in truck models and features.

Orton Motor Co., Ltd., Petrolea, will begin manufacturing in its Canadian branch this fall.

Mutual Truck Co., Sullivan, Ind., has completed plans for an addition to its plant.

TERMAAT-MONAHAN EXPANDS

OSHKOSH, WIS., Sept. 20—The Termaat-Monahan Mfg. Co., operating a large foundry and machine shop manufacturing vehicles and marine engines, portable drag saws and other power equipment, has completed improvements in its plant by which the capacity is

increased at least 200 per cent. The gray iron foundry has been enlarged 40 x 100 ft., and an auxiliary building, 50 x 100 ft., added, making it possible to handle 20,000 lb. of castings daily. The machine shop has been rearranged and retooled for greater efficiency and capacity. The improvements have been made under the direction of the new vice-president and general manager, George H. Mueller. He is a graduate of Cornell and Purdue, and formerly was with the Willys-Overland interests and the Jeffery Mfg. Co., Columbus, Ohio. During the war he served as chief engineer of the Curtiss Aeroplane & Motors Corp.

Rubber Importations
Increase in August

NEW YORK, Sept. 21—Figures compiled by the Rubber Association of America in connection with crude rubber importations into the United States during the month of August show an increase of shipments received in that month over the corresponding period last year. The figures are extremely interesting in view of the rumors that have recently been circulated in some quarters to the effect that Great Britain was considering taking steps to place an embargo on exports of crude rubber.

It is understood that there are large stocks of crude rubber in this country, due to the fact that manufacturers have not been buying heavily, preferring to wait until conditions have become more stabilized. The rubber goods manufacturers, like the manufacturers in many other lines, have been obliged to proceed slowly in their commitments because of the lack of buying power on the part of the consumer.

SEAMAN PRODUCTION TO START

MILWAUKEE, Sept. 20—The new \$1,000,000 plant of the Seaman Body Corp. is nearing completion and will go on a regular production schedule about Oct. 1 or 10, according to present indications. The principal part of the output will be absorbed by the Nash Motors Co. in supplying the needs of its new Four Cylinder Car Division, a \$2,500,000 plant erected in Milwaukee and now in production. The new Seaman plant will employ 1000 men. It is laid out in units which eventually will mean an investment of \$8,000,000, and make it the largest passenger car body works in the country.

WRIGHT SUES ON PATENTS

NEW YORK, Sept. 20—Suit has been brought by the Wright Aeronautical Corp. against Handley-Page, Ltd., the Aircraft Disposal Co., Ltd., and William H. Workman in the United States District Court, for alleged infringement upon patent rights. Injunctions and an accounting of profits are asked.

The action is based on patents issued in 1906 to Orville and Wilbur Wright, and which were transferred to the Wright Aeronautical Corp. last October.

METAL MARKETS

LACK of fresh orders, the outstanding feature of the metal markets, continues to be charged chiefly to the automotive industries but, in fact, is the prevailing condition throughout the metal consuming industries. The railroads which, it had been thought, would fall over one another to place equipment business, once the freight and passenger rate increases had been granted them, are taking their own sweet time about buying steel. A few orders for rails were placed with the price left open, this omission of a fixed selling level being interpreted as showing that both buyer and seller are confident they will profit by permitting future developments to determine the price. Although at no time anything but a nominal affair, the \$50 pig iron market is dying hard. Sales for first quarter 1921 delivery were made in the Middle West in the last few days on a basis of a shade better than \$45 but the spot market is still called \$50 by sellers, buyers being disinterested because they are not taking any spot metal. A Pennsylvania automobile engine builder is reported to have disposed in the last few weeks of around 10,000 tons foundry, malleable and charcoal iron at the prevailing market levels and to have cleaned up handsome profits. Steel mills are cleaning up old contracts and, while buyers are out of the market, there is also an absence of selling pressure, due on the one hand to the majority of the plants having sufficient orders on their books to tide them over the remainder of the year and, on the other, to a general feeling of resignation to the fact that fresh business will be held in abeyance until after election.

Pig Iron—Automotive foundries in the Middle West are reported to have asked further postponement of deliveries on malleable iron due them. Sellers were able in nearly all instances of this kind, to place this metal with other consumers, thereby preventing accumulations at their furnaces. The foundry market is still called a \$50 affair by sellers but, in what few and far between sales take place, \$46 appears to be the approximate consideration.

Steel—Passenger car builders who a few months ago outbid one another in their eagerness to secure strip steel, are now definitely out of the market and, as a result, cold rolled strip is offered freely at 8½¢. base, Pittsburgh. Hot rolled is offered at 5½¢. base, Pittsburgh. The market for steel sheets is growing more and more in buyers' favor and some of the independent mills are now glad to sell at \$10 below the levels asked and paid a few months ago. In fact, some of the smaller rolling mills appear to be very close to the point where they will be compelled to trim their prices still more to keep running. Rumors of blue annealed sheets being offered at as low as 5¢. base, have been in circulation lately.

Aluminum—Second hands are reported to have sold foreign sheets recently at as low as 55¢. base. Demand for ingots is light. The sole American producer, however, is reported to be busy to capacity on old contracts.

Lead—Imported metal is still available at \$5 to \$10 a ton below the quotation of the chief American producer, which is 8½¢. New York. The immediate future of the market hinges on the exchange situation.

Zinc—Zinc continues to be quoted at about the cost of production and domestic producers, unless in urgent need of funds, are not eager to sell at the present prices. Imported metal, however, can still be brought in and sold at a profit in the present market.

Automotive Financial Notes

Gary Motor Truck Co., Gary, Ind., shows total sales for the fiscal year ended Aug. 31 as \$2,310,330.68, with net profits of \$219,269.23. A dividend of 10 per cent was declared payable quarterly beginning Oct. 1. The board of directors was increased from five to seven. W. H. O'Donnell retired, and Theodore B. W. Zumstain, Robert L. Scott and J. A. Blodgett were elected to the board. The company will make a 1-ton pneumatic tired truck, for which the plant will be enlarged.

The Rubber Co. of Canada, Ltd., is offering \$600,000 in 8 per cent cumulative participating preferred shares at \$100 per share with a bonus of 25 per cent common stock. The company is capitalized at \$1,000,000 preferred stock and \$1,000,000 common stock. All of the common is to be issued and \$600,000 of the preferred. The company has no bonded debt. It has acquired as a going concern the Panther Rubber Co., Ltd., with plant at Sherbrooke, Que., a six year old company.

Mullins Body Corp. earned \$134,300 before Federal taxes in August, compared with \$134,958 in July. For eight months ended Aug. 31 net earnings before Federal taxes were \$881,300, compared with \$452,726 for the seven months ended Dec. 31, 1919. Continued earnings of \$100,000 a month for the balance of the year will bring net earnings for the year to approximately \$1,200,000, equivalent to about \$10 a share on the common stock.

Oak Tire & Rubber Co., Oakville, Ont., has increased its capital to \$3,000,000, of which one half is 8 per cent participating preferred and the remainder common. A new charter has been granted and shareholders are asked to exchange their old stock for new. A special bonus of 100 per cent in common shares will be distributed.

The Ramstack & Sons Mfg. Co., Milwaukee, manufacturer of spark plugs and other internal combustion ignition specialties, has increased its capitalization from \$100,000 to \$200,000, to handle a largely increased volume of business made possible by the recent enlargement of its plant and equipment.

Fisher Body Ohio Co. expects to pay its initial quarterly dividend on Jan. 1, when the accumulation of bank dividends will amount to over \$8 a share. Net earnings for the first year of operation is expected to equal \$18 a share on the \$10,000,000 8 per cent preferred stock outstanding.

Elgin Motor Car Corp. will increase its capitalization \$2,000,000 to \$5,500,000, the new funds to be used for additions and equipment. The company plans an increased production of 50 per cent in the spring. Officials said a liberal dividend would soon be declared.

Vervoort Bearing Co., Cleveland, has been chartered with a capital of \$50,000 to manufacture and sell combination roller and ball bearings. The incorporators are Lambert H. Vervoort, Henry J. Foss, A. C. Kauffman, J. H. Ballard and A. C. Altman.

Commercial Automotive Products Co., Youngstown, Ohio, has been chartered with a capital of \$285,000 to manufacture parts and accessories for automobiles. The incorporators are A. W. Frantz, E. D. Reselting, G. M. Montgomery, A. R. Calvin and O. Mitchell.

International India Rubber Corp., South Bend, Ind., paid a semi-annual dividend of 3½ per cent on preferred stock Sept. 15. The name of the corporation is to be changed to the Odell Rubber Co., for purposes of simplicity.

Latex Tire & Rubber Co., Fond du Lac, Wis., has increased its capital stock from \$500,000 to \$1,000,000 to permit of increased operations. T. W. Meiklejohn has been added to the board of directors.

Lapeer Tractor Truck Co., Lapeer, Mich., has changed its name to Lapeer Trailer Corp., and increased its capital stock from \$100,000 to \$300,000.

Gardner Motor Co. estimated earnings for the year at \$6 a share based on an annual production of 10,000 cars. The present output is at the rate of 14,000 cars.

Hanson Motor Co. will increase its capital from \$1,500,000 to \$2,500,000. Most of the new issue is to be taken by present stockholders.

Willys-Overland Co. will pay a regular quarterly dividend on Oct. 1 of \$1.75 a share on all outstanding preferred stock.

Hartford Automotive Parts Co. has purchased the entire issue of Acme Universal Joint Mfg. Co. stock.

Locomobile Company will pay the regular quarterly dividend of 1½ per cent on preferred stock Oct. 1.

Rubber Products Co., Barberton, Ohio, will double its capital stock to the new figure of \$200,000.

Dependable Truck & Tractor Co., Galesburg, Ill., has increased its capital stock from \$750,000 to \$2,500,000.

Pierce-Arrow Reports Improved Business

BUFFALO, Sept. 21—Reports current in other cities that the plant of the Pierce-Arrow Motor Car Co. would be closed indefinitely were denied emphatically to-day by officials of the company. It was asserted new men were being taken on every day.

A steadily increasing volume of truck business is being received and production will be enlarged as the plant gets into the swing of turning out the new dual-valve models. Output has been running at around 66 per cent but the swing now is upward.

Earnings for the second half of the year, allowing for the decrease in business, are estimated at about \$1,000,000. This would be at the rate of \$2.40 a share on the common after allowing for preferred dividends, bringing the rate for the year to \$6.49 on the common. In 1919, the earnings on the common amounted to \$6.75 a share.

TO BUILD NEW MOTOR BUS

NEW YORK, Sept. 21—The Trackless Transportation Corp. has been organized under the laws of the State of New York to foster the use of motor buses for public transportation throughout the country. The company will operate as a sales and engineering company. George R. Bidwell is president; Herbert Y. McMullen, vice-president, and Ezra C. Bull, secretary and treasurer.

The company plans to put on the market a specially designed motor bus which

will in no sense be a motor truck chassis converted to carry a bus body. Contracts are now being placed for the manufacture of the bus and the company plans to soon supply cuts and specifications of its line.

Bank Credits

Written exclusively for AUTOMOTIVE INDUSTRIES by the Guaranty Trust Co., second largest bank in America.

NEW YORK, Sept. 23—Railway freight tonnage moved in the four weeks ended Aug. 28 was the largest for any like period this year and larger than for August of any previous year. The shortage of cars is apparently increasing, however. For the week ended Sept. 4, the number of cars for which shippers filed requisitions exceeded by 146,000 the number available.

The most significant feature of the local money market in the last week has been the continued easing of time loan rates. For loans on mixed collateral 8 per cent was quoted on Monday, which compares with 8½ per cent a week earlier. Corresponding reductions are recorded in rates on all-industrial money.

It is not clear to what extent this easing of interest rates may be due to slackening activity in some industrial lines or to temporary accumulations by banks and corporations. It is too early, moreover, confidently to regard this easing as representing a permanent lowering of interest rates. Probably the peak of the crop demands will not be reached until three or four weeks later. The generally sustained advances in stock exchange prices are indicative of increased confidence in the business outlook. The liabilities involved in commercial failures during August, however, were \$28,372,895, as compared with \$21,906,412 in July. The corresponding figure for August, 1919, was \$5,932,393.

The heavy volume of quarterly transactions last week was effected without disturbance, although the magnitude of the operations was reflected in the weekly statement of both the Clearing House and the Federal Reserve banks. Clearing House members' loans increased \$112,981,000 last week, and demand deposits, \$85,067,000. Excess legal reserves, \$19,295,410, however, were only \$4,783,790 lower than a week earlier.

The technical position of the Federal Reserve banks was materially improved last week. There were aggregate reductions of \$165,996,000 in bills discounted, and of \$161,373,000 in total bills on hand. Net deposits declined \$101,130,000, and the contraction of Federal Reserve notes in circulation by \$5,494,000 was the first reduction of the volume of these notes since July 23. Despite a loss of \$97,460,000 in the gold settlement fund, total gold reserves were reduced by only \$3,099,000. The net result was an increase in the ratio of gold reserves to Federal Reserve notes, after setting aside 35 per cent against net deposits, from 46.8 per cent to 48.1 per cent.

Men of the Industry

Frank T. Windle, of Chicago, has been placed in charge of the new factory branch organization of Willys-Overland, Inc., in St. Louis. He was formerly Overland territory man in the Central West district. H. R. Henry, who was wholesale sales manager of the Overland Automobile Co., which was taken over by the factory branch, has joined the staff of the Traffic Motor Truck Corp.

J. G. Culbertson, president of the Wichita Motors Co., Wichita Falls, Texas, has been nominated for governor by the Republicans of Texas. The platform adopted by the Republican party declares for the open shop. Culbertson is a member of the board of governors in the Southwestern Open-Shop Association.

Ralph E. Davis, director of the Wisconsin School of Mines at Platteville, has resigned to accept the position of consulting engineer on the staff of one of the big oil corporations with headquarters at New York. He is succeeded as director by Homer B. Morrow, who has been instructor in mechanics for several years.

Ralph C. Chesnutt has resigned as designing engineer with the Bethlehem Motors Corp. He was formerly with the North American Motors Co., and came to Bethlehem when these companies merged. He designed the engines now used in Bethlehem trucks. His plans for the future are not announced.

Joseph Jandasek has been appointed chief engineer for Bollstrom Motors, Inc., St. Louis, Mich. He was formerly tractor and truck engineer with the Paige Detroit Motor Car Co., and was also connected with F. C. Austin Co., Chicago; Plano Tractor Co., and Laurin Klement, Prague, Czechoslovakia.

George C. Hubbs has assumed the position of vice-president and general manager of the Grant Motor Car Corp., Cleveland. For the past six years he had been connected with the Dodge Bros. organization, and previous to that had been connected with the United States Tire Company.

P. L. Emerson, president and general manager of Jackson Motors, Inc., the selling company of Jackson Motors Corp. (the manufacturing company), has resigned to give his complete time to the distributing companies which he controls.

T. D. Scoble, Jr., formerly advertising manager of the Yale & Towne Mfg. Co., has formed the Scogreene Advertising Service, Inc., which will be located at 59 Fourth Avenue, New York. With him in the venture is R. A. Greene.

R. M. Graham has taken over the factory management of the Chillicothe Tire & Rubber Co., succeeding C. C. Cushman. Graham was formerly an efficiency engineer with the Goodrich company at Akron.

C. I. Crippen has been placed in charge of the Youngstown, Ohio, office of Dwight P. Robinson & Co., Inc., engineers and constructors. H. P. Clawson has been placed in charge of the Cleveland office.

D. A. Goodkind has resigned as sales manager of the Lucia Mfg. Co., Inc., New York. The sales office of the company has been moved from 1123 Broadway, New York, to the factory at Hartford, Conn.

Roy Davey has returned as general sales manager of the Bethlehem Motors Corp., after seven months' absence.

SCOTT NOW NOVO PRESIDENT

LANSING, MICH., Sept. 20—R. H. Scott, general manager of the Reo Motor Car Co., was elected president of the Novo Engine Co. this week. Other officers are; C. E. Bement, vice-president and general manager; D. R. Hoadley, secretary; E. J. Bement, treasurer; E. P. Teel, general superintendent. The directors also ordered a 10 per cent cash dividend to be paid in quarterly installments.

PORTER OPENS OFFICES

NEW YORK, Sept. 21—Finley R. Porter, recently resigned as chief engineer of the Curtiss Aeroplane Corp., and during the war who served as chief engineer at McCook Field, Dayton, Ohio, has opened general engineering offices under the name of Finley R. Porter & Co., 56 Pine Street, this city. Instead of carrying on a consulting business only the organization is prepared to take hold of propositions and carry them through the manufacturing stages.

HENRY L. LARISEY DIES

SPRINGFIELD, MASS., Sept. 20—Henry Leon Larisey, who was found dead in bed, a victim of a heart attack, at the home of his sister in New York, was sales manager of the tractor division of the New Britain Machine Co., had been engaged for many years in truck and tractor sales and, prior to joining the Connecticut corporation, was general manager of the Short Turn Tractor Co. of Minneapolis.

Safety Council Sets Program for Congress

CHICAGO, Sept. 20—The automotive section of the National Safety Council will hold its sessions at the Ninth Annual Safety Congress, Milwaukee, on Wednesday afternoon, Sept. 29, and Thursday morning, Sept. 30. The congress will open Sept. 27 and continue to Oct. 1 with sessions of the different sections assigned to special days.

James J. Lynch of the Chevrolet Motor Co., New York, is chairman of the automotive section, and **R. A. Shaw** of the Department of Safety and Factory Hygiene, Ford Motor Co., Detroit, is vice-chairman. **R. F. Thalner**, safety engineer of the Buick Motor Co., Flint, is secretary. Talks set for the first session are Fire Drills and Fire Alarm and Drills Signal Systems, **G. E. Sanford**, General Electric Co., Lynn, Mass.; Efficiency and Safety, **H. G. Somes**, electrical engineer, Chevrolet Motor Co., Tarrytown, N. Y.; Punch Presses, **August L. Kaems**, safety engineer, Simmons Co., Kenosha, Wis.

At the opening of the second session the nominating committee will report. Addresses following will be **Tracing the Real Cause of Accidents**, **H. L. Gaddis**, service manager, Great Lakes Engineering Works, Detroit; **Human Relations and Accident Prevention**, **Victor T. Noonan**, director Ohio Accident Prevention Bureau, Columbus, and **Millwrights**, **George W. Bowie**, safety engineer, American Car and Foundry Co., Detroit.

Education to Feature Sixth Tractor Show

COLUMBUS, Sept. 21—The management of the National Tractor Show has started work on the educational program and in this work has the active co-operation of the faculty of the Agricultural College at Ohio State University. On this program will be found, it is expected, the outstanding authorities in agricultural engineering in the United States. In addition to the lecture course efforts are being made to secure men for the night mass meetings who will attract very large audiences and there is every prospect that these efforts will be successful.

In connection with the educational lectures and the mass meetings an effort is being made to interest every exhibitor in the educational program to the extent that he will not only install a service booth, where this is practical, putting competent service men in charge who will be able to answer all questions regarding repair, operation, etc., but also will build into his exhibit some educational idea. Where this matter has been taken up with exhibitors there has been a whole-hearted response, and it is safe to say, at this early date, that the 1921 show will have a greater educational value to the farmer and dealer than any exhibit of farm equipment.

Traffic Bill Drawing Advanced to November

CLEVELAND, Sept. 21—Executives of the automobile industry, police chiefs, representatives of motor clubs and traffic experts will meet here Nov. 10 to draft a uniform bill for all states in the United States and in Canada. The work to be done in this city will be a continuation of the task started at the convention of traffic authorities in San Francisco Aug. 23 to 27.

The gathering in this city was originally scheduled for Dec. 2, but it has been set forward so that the model measure may be submitted to proper authorities long enough in advance of the meeting of legislatures to enable them to organize for the task of putting the bill across.

While a subcommittee of the National Traffic Men's Association has been entrusted with the responsibility of drafting the proposed measure, yet men interested in the subject throughout Canada and the United States will be given an opportunity to present arguments. The best of the traffic rules in the two countries will be adopted.

Calendar

SHOWS

- Sept. 27-Oct. 2—Buffalo, Closed Car Show, Buffalo Automotive Dealers' Ass'n, Elwood Music Hall, C. C. Proctor, Mgr.
- Oct. 4-9—Little Rock, Ark., Enclosed Car Show, Little Rock Automobile Dealers' Ass'n.
- Oct. 5-9—Minneapolis, Enclosed Car Show, Minneapolis Automobile Trade Ass'n.
- Oct. 6-16—New York, Electrical Show, Grand Central Palace, George F. Parker, Manager.
- Nov. 14-21—New York, Automobile Salon, Commodore Hotel Ballroom.
- Nov. 15-20—Chicago, Automotive Equipment Show, Coliseum, Automotive Equipment Association.

Dec. 10-18—New York, Motor Boat Show, Grand Central Palace.

Jan. 8-15—New York, National Passenger Car Show, Grand Central Palace, Auspices of N.A.C.C.

Jan. 29-Feb. 4—Chicago, National Passenger Car Show, Coliseum, Auspices of N.A.C.C.

Feb. 5-12—Minneapolis, Annual Automobile Show, Minneapolis Automobile Trade Ass'n.

Feb. 6-12—Columbus, National Tractor Show, Columbus Tractor & Implement Club, Ohio State Fair Grounds.

FOREIGN SHOWS

October—London, Commercial Vehicle Show, Olympia.

Nov. 4-13—London, International Motor Exhibition, Society

Motor Mfr's and Traders, Ltd., Olympia and White City.

Nov. 6-13—Christchurch, N. Z., Olympia Motors Exhibition.

Nov. 29-Dec. 4—London, Cycle and Motorcycle Show, Cycle and Motorcycle Mfr's and Traders Union, Ltd., Olympia.

Jan. 7—Sydney, Australian Motor Show.

Jan. 22-29—Colombo, Ceylon Motor Show.

CONTESTS

Sept. 25—Allentown, Pa. Dirt track.

Oct. 1-2—Trenton, N. J. Dirt track.

Oct. 8-9—Danbury, Conn. Dirt track.

CONVENTIONS

October — Cleveland, Service Managers' Convention, National Automobile Chamber of Commerce.

Oct. 11-13—Chicago, National Association of Purchasing Agents' Annual Convention.

Oct. 20-22—Atlantic City, Twenty-seventh Annual Convention National Implement and Vehicle Association, Hotel Traymore.

Dec. 7-10—New York, Annual meeting American Society of Mechanical Engineers, Engineering Societies Building.

Dec. 8-9—Cincinnati, Annual Convention, Ohio Automobile Jobbers' Association.

Jan. 11-13—S. A. E. Annual Meeting, New York City.

Los Angeles Opens
Coast Tractor Show

LOS ANGELES, Sept. 20—With more than 400 exhibits by 110 participants the first of the regional national tractor shows opened to-day. The first crowd numbered not more than 5000, but all attending seemed quite eager for any information pertaining to improved methods of power farming. Forty makes of tractors on display were the chief objects of interest. A few never had been exhibited in any show.

The show is very compact, even congested, the entire layout being crowded into about 60,000 feet. It is an open air event held in a sycamore tree grove about fifteen miles from the city, easily accessible by motor and rail. This is supposed to be primarily a dealers' show rather than a consumers' and for that reason large attendance is not sought as much as a buying crowd.

Dealers attending represent all states west of the Rocky Mountains and Mexico. There are no field demonstrations and this show will determine whether still events in open air are practical, all previous shows on coast having featured performances. There is nothing of a competitive nature and no mechanical tests. Pocatello, Idaho, has a delegation here promoting that point for next year's show.

LAFAYETTE TO TEACH SERVICE

INDIANAPOLIS, Sept. 20—LaFayette Motors Co. has established a post graduate service school at the plant where service men employed by the various distributors throughout the country will come for instruction in LaFayette services.

Under the supervision of D. McCall White, designer of the LaFayette, and D. C. Selheimer, works manager, the service men will be given instruction in production methods, ignition and carburetion, and will be told the engineering features of the car in lectures by White. Engine, transmission and axle will be torn down and built up by

the men under the direction of White and the other engineers. W. A. Houser, technical manager, is in direct charge of the school, and F. E. Cooper, superintendent of final inspection, is in actual charge of instruction.

Chevrolet Car First
in Denver-Pueblo Race

DENVER, Sept. 20—W. A. Coleman, in a Chevrolet, won the \$500 first prize in a twenty car race of 120 miles from Denver to Pueblo to-day, in 2:09:40 on a graveled road. His was the eighteenth car to start and the second to reach the finish line.

Horace Franz, in Essex; Tom Roberts, in Marmon, and Clarence Shockley, in Studebaker, won second, third and fourth prizes. Factory Pilot Leo Banks in Revere Special made the fastest time of one-fifteen for the seventy-five miles to Colorado Springs but was wrecked in a ditch about five miles farther on and received a broken leg and shoulder.

Fifteen other cars starting were Fiat, two Chevrolets, two Marmons, Studebaker, Noremac Special, Gold Bug Special, Hutchin Special, Templar, two Chalmers, Haynes, Anderson and Oldsmobile. Thousands of persons and hundreds of cars lined the course. The race attracted extra crowds because it was run on the opening day of the Colorado State Fair at Pueblo. The event was staged by the Denver Times and Pueblo Star Journal. Starting cars one minute apart resulted in many spectacular brushes.

DE PALMA SETS NEW MARK

SYRACUSE, Sept. 18—Ralph de Palma established three new world records on an oval dirt track at the State Fair here this afternoon against one of the fastest fields in the country, including Gaston Chevrolet, Eddie O'Donnell and Jimmy Murphy.

In the ten-mile race de Palma set a figure of 7:47.60 against the old record of 7:56.40. For the twenty-mile stretch the official time was 16:08.98 against 16:25.60, the old record. The new fifty-mile record is 40:49.68 against 40.58.

Electric Manufacturing
to Feature Exposition

NEW YORK, Sept. 20—The Electrical Exposition of 1920, the thirteenth annual display and demonstration of invention and development in the electrical field, will open in Grand Central Palace, Oct. 6 and continue for ten days. A record variety of exhibits has been arranged for, representing a forty-eight per cent increase over the 1919 show, and three floors of the big Palace will be filled with displays and demonstrations of a thousand and one uses of electricity.

The entire third floor of the palace has been given over to a series of working exhibits where the employment of electricity in a score of industries will be demonstrated. One will be material handling, with industrial trucks, conveyors and hoists all in operation. The Material Handling Machinery Manufacturers Association and the Electric Hoist Manufacturers Association are co-operating with different makers in this particular exhibit.

Among the processes of manufacture to be seen in actual operation are wood working including furniture making, welding, japanning, heat treating, rivet heating, oil tempering and heating with vacuum furnaces. Complete processes will be shown in a bakery, a laundry, a refrigeration plant, battery charging plant, etc. Three types of machine shops will be operated and there will be a special exhibit showing factory lighting, particularly in regard to the factor of safety.

TO BUILD LONE STAR TRAIL

WINNFIELD, LA., Sept. 20—Organization to assure the building of Louisiana's share of the Lone Star Trail, running from St. Augustine, Fla., to Los Angeles, Cal., was completed here Sept. 15. The organization of the Texas division, at Dallas, will be next taken up. This transcontinental highway runs east and west between the Dixie Overland Highway on the north and the Old Spanish Trail on the south.